The Chemical Age

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Contents

PAGE

EDITORIAL NOTES: Things that Need Attention; The Problem of Cyanamide; Sampling of Chemicals; Well-informed Buying; Fluctuations in Makers' Prices; "Get Into Europe Quickly" ... 111
The Growing Chemical Industry of Palestine. By Dr. Percy E. Spielman ... 114
Preliminary Notes on the Fine Chemical Exhibits at the British Industries Fair ... 116
CORRESPONDENCE ... 118
The Qualifications of Gas Examiners ... 119
Sulphuric Acid Plant Improvements; Institution of Chemical Engineers ... 120
Naphthalene in Coal Gas; The Chemical Warfare Problem ... 121
New Methods of Crystal Analysis; Chemistry of Plant Pigments ... 122
From Week to Week ... 123
References to Current Literature ... 124
Patent Literature ... 125
Market Report and Current Prices ... 128
Manchester Market Report ... 130
Scottish Chemical Market ... 131
Company News; Chemical Trade Inquiries ... 132
Commercial Intelligence; New Companies Registered ... 134

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Things that Need Attention

IT is clear from the communications published in this issue that what was recently said on "The case of the young chemist" touched a very live problem. Three of the letters are from chemists who have worked hard and expended considerable time and money on the necessary training, and who are unable to find employment for their gifts. The fourth, from an Edinburgh undergraduate, expresses only too truly the impressions of those who are still in course of training. Numbers of fully qualified men can find no work in their profession; students who are following on see the fate of those a little way ahead and are depressed. Perhaps the most pathetic part of the business is that one can do nothing more than express one's sympathy with the writers and publish the facts in the hope that they may meet a friendly eye. Meanwhile, the point to be again emphasised is that British chemical industry, the future of which depends so vitally on a supply of efficient chemists, has no central organisation capable of dealing with unemployment. It is a problem which deeply touches all the societies and yet which nearly all of them leave to anybody else.

Another letter reaches us in reference to our note of last week on "Chemical salesmanship." The number of salesmen engaged in chemical industry probably runs to a few thousand. Their function is one of the most responsible character, and calls for experience, technical and trade knowledge, tact, and initiative. They are really the catalysts of trade. What they know collectively of chemical trade would, indeed, be worth knowing. Yet, as our correspondent points out, there is no association of chemical salesmen in existence, no means of their sharpening one another's wits and methods by exchange of ideas, of getting to know one another, or of meeting together for joint action or conference. They are just so many units, doing valuable work in their own channels, but lost as a collective force for the development of British trade. Here, again, we have an unexplored field which none of our existing societies touches—a field full of ideas and initiative and well worth intensive cultivation.

What organisation is there to which one can look for a lead on such problems? We have more than once expressed the opinion that the centre of British chemical industry to-day lies in the A.B.C.M. Within a few years, by a combination of imagination, practical insight, and well-directed collective effort, it has become our most powerful and practical organisation. It is essentially the body to get things done and done well. We venture to offer a suggestion. The fortnight during which the British Industries Fair will run will supply an excellent opportunity for a few practical conferences on chemical problems among people who rarely have such an opportunity of meeting. Half a dozen such meetings, limited to an hour, with short five or ten minutes papers, would add immensely to the attractions of the chemical section, and probably start many fresh ideas with excellent results. What does Mr. Woolcock say?

The Problem of Cyanamide

IN last week's issue of THE CHEMICAL AGE at least two contributors, in dealing with the relative merits of various fertilisers, drew attention to a point in connection with cyanamide which calls for close study by all classes of fertiliser consumers. In his article on "Some Chemical Aspects of Agriculture," Mr. E. Holmes remarked that under certain soil conditions it has been found that calcium cyanamide polymerises to calcium dicyanodiamide, which is poisonous to plants and to nitrifying bacteria; while Dr. Sidney Williamson gives the impression that the substance is not altogether satisfactory by his statement that cyanamide as a fertiliser *per se* does not appeal to the farmer and has certainly not proved popular with German agriculturists.

There is a general impression, in fact, that the production of cyanamide is likely to be gradually curtailed in all countries, unless a process is devised whereby

it can be converted cheaply into some other form useful as a fertiliser, such as urea. Apart from its possible toxic action there are other objections to cyanamide which arise from its physical condition. Special precautions are taken at the factory to free it from calcium carbide, and it is sent out in a finely divided state, in which condition it is objectionable to handle, the labourers getting in into their mouths, eyes, and noses, where it causes inflammation. If used alone, therefore, it should always be sown by means of a mechanical distributor. Numerous attempts have been made to overcome the physical drawbacks which the material presents, and it will be recalled that one promising proposal emanating from Germany was that about 4 per cent. of a heavy tar oil should be added to overcome the dustiness.

Sir E. J. Russell, in a summary of field trials with various nitrogenous fertilizers, showed that their order of effectiveness is—nitric nitrogen 100, ammoniacal nitrogen 97, and cyanamide 90 or less. He pointed out, however, that the relative position of cyanamide arises from the fact that it has to undergo a preliminary decomposition in the soil into ammonia, the mechanism of the change not being quite clear. It is suggested that a thorough understanding of this change would probably improve the relative position of cyanamide by indicating the types of soil to which it is not appropriate and to which, therefore, it should not in fairness be applied. It would seem, however, that the most promising future for cyanamide lies in its utilisation entirely as a mixed fertiliser, in which form considerable quantities are now employed. A recent process which seems to promise well is that in which the nitrolim is worked up with sulphite cellulose pitch, a waste product of paper manufacture. The resulting product is free from dust, and it is claimed that refuse from cellulose and paper works may be added to increase the fertilising value of the mass. The whole situation with regard to cyanamide is, however, rather nebulous at the moment, and it may be that the ultimate solution of the present problems will be found in the conversion of the material into ammonium chloride and the employment of this as a fertiliser.

The Sampling of Chemicals

We are asked by the Commissioners of Customs and Excise to draw the attention of importers and agents to the fact that when chemicals or other articles of value are sampled by Customs Officers for the purpose of determining by analysis the question of liability to Customs duty, any portion of the sample which may remain unused by the Government chemist will be returned to the importer if a request to that effect is made to the officer at the time of sampling. In this connection the Government chemist desires it to be known that the quantity used for test would in many cases be substantially reduced if importers would assist by furnishing information to the best of their ability as to the constituents of the article sampled. Such information, we are informed, will be treated as confidential, and, if preferred, may be forwarded direct to the Government Chemist, Government Laboratory, Clement's Inn Passage, London, W.C.2. The Commissioners further state that in the case of compound articles not chargeable with duty as a whole, but merely in respect of one or more dutiable ingredients or parts, the assessment of duty would be materially facilitated, and delay consequently avoided, if arrangements could be made for the value of the dutiable ingredients or parts to be shown on the invoice in addition to the total value.

Well-Informed Buying

In our last issue we commented in these columns upon the recently published Report of the Advisory Committee for Coal and the Coal Industry, and it will not, perhaps, be out of place to supplement our previous arguments by referring to some of the drawbacks with which the large industrial consumer has to contend. The smaller consumer suffers in common with his bigger colleague in industry; but purely from the standpoint of the magnitude of the monetary loss which may be involved by some of our haphazard methods the case of the latter forms the most obvious illustration. The large coal consumer learnt a great deal during the war; and the fact that he was at times saddled with whole consignments containing some 25 per cent. of inert matter awakened his attention to the urgent necessity for some revision of the basis upon which coal is bought. The majority of coal users lack facilities for selecting the grades best suited to their needs, and it has been rightly said that most coal is sold on its name or on the reputation of the operating company or local dealer. Unfortunately, the majority of coal buyers display a good deal of lethargy when it comes to taking active measures to protect their own interests, the result being that many of the suggestions which have been advanced during the past few years have never got much further than the lecture room. Most pertinent of these is undoubtedly the contention that calorific value should be made a basis on which to adjust the value of coal, in much the same way as, say, sulphate of ammonia is invariably dealt with on a definite percentage of ammonia basis. Thus, with coal a certain price per ton would be charged for a definite calorific value, and a *pro rata* reduction would be made when the heating value fell below the standard. As an instance of what some of the big industrial undertakings find a profitable policy, it may be mentioned that one big South London concern which consumes well over a million tons of coal per annum has found it desirable to establish a fully-equipped laboratory and inspection staff practically at the pit-head. It is said that in this instance the coal is sampled as it is loaded into the undertaking's own ships, results are quickly arrived at by analysis, and they are telegraphed to London in time to give those responsible for the operation of the works an opportunity for regulating the plant to suit the particular characteristics of a particular coal by the time it has arrived. This we have no hesitation in describing as a system of well-informed buying which in the long run must be responsible for economy the magnitude of which it is difficult to estimate.

The time has undoubtedly arrived when those collieries which produce coals showing considerable variation in both chemical and physical properties should classify the different varieties and segregate them. The same question has recently been discussed

in America by Dr. Bain, who is anxious to see the institution of a classification which will permit of a wider pooling of coal. What is wanted is a system which would justly penalise indifferent coal and ensure that each grade would sell on its merits.

Fluctuations in Makers' Prices

A CORRESPONDENT draws attention on another page to the remarkably wide difference in the prices of chemicals quoted by British firms. He takes four cases from his recent experience, and these show in relation to seven specified articles variations in price ranging from 16s. 2d. to 19s. 6d., 19s. 4d. to 28s., 2s. 6d. to 4s. 6d., 11d. to 9s., 7s. to 11s. 6d., 3s. to 13s. 6d., and 2s. 6d. to 4s. 10d. The most obvious explanation is difference in quality, but that is inadequate because the quality was carefully specified in the order, and a higher or lower degree should not account for more than a fraction. That is to say, if here is any specific chemical or physical standard to be applied to the specification. Such a term as "best quality," for example, might mean almost anything according to the domestic standard of the individual firm. Gradually commercial and manufacturing practice is coming to recognise the value of standardisation as guaranteeing an assured quality to the purchaser and therefore tending to build up reputation and confidence. By the adoption, again, of a scientific costing system firms in approximately equal conditions should be able to produce at an approximately equal cost, and a general agreement against undercutting which seems a natural corollary is good for all producers, and good in the end also for the purchaser in the sense that for a standard price he can count on a standard quality. This, after all, is much more satisfactory to all parties than what happened in the present case. Here a specified quality is offered at prices bearing no relation to one another, with the result that the inquirer is left wondering if there is a "snag" somewhere. It would be interesting, as our correspondent says, to have some trade opinions on the wide variation his figures disclose.

"Get into Europe Quickly"

SIR ERNEST BENN, in urging British firms to "get into Europe quickly," reminds them that whatever view may be taken of the political situation as between France and Germany there can be little doubt that for the moment the state of affairs on the Ruhr gives our trade and commerce opportunities which were not available a few weeks ago. "The rush from the Continent for English coal," he states, "is a matter of common knowledge, but coal is only one of a thousand things which Europe has been buying from the Ruhr and which for the moment are no longer obtainable from that source." Those alert chemical firms, whose representatives were waiting on the frontier for days in order to get into Germany the moment the country was opened to traders, will need little urging to take the fullest advantage of the present conditions—they are probably already benefiting from them, as our market notes on export trade showed last week. But the appeal is appropriate to any laggards who are waiting for business to be brought to them instead of searching it out for themselves, and who fail to realise, as Sir Ernest Benn points out, that "the thousand million people of Europe have, somehow or another, to get through the day and live, notwithstanding the decisions of the Reparation Commission." If these people cannot secure what they want from the Ruhr, they will get it somewhere else, and their present need is the opportunity of enterprising British firms.

Points from our News Pages

Dr. P. E. Spielman, who has recently returned from Palestine, gives his impressions of the growth of chemical industry in that country (p. 114).

Preliminary notes are given on the fine chemical exhibits at the forthcoming British Industries Fair (p. 116).

Letters to the Editor deal with "the case of the young chemist," chemical salesmanship, the colouring of poisons, and variations in chemical manufacturers' quotations (p. 118).

Sir Arthur Duckham was elected first President of the Institution of Chemical Engineers at the last meeting of the Council (p. 120).

A brisk market with a substantial volume of business transacted are recorded in our London Market Report (p. 128).

Our Scottish Market Report states that Continental offers continue to be numerous with a tendency towards higher prices (p. 131).

Books Received

INORGANIC CHEMISTRY. By G. S. Newth. London: Longmans Green and Co. Pp. 772. 8s.

THE STRUCTURE OF ATOMS. By Alfred Stock. London: Methuen and Co., Ltd. Pp. 88. 6s.

The Calendar

Feb. 5	Royal Society of Arts: "The Vulcanisation of Rubber." H. P. Stevens. 8 p.m.	John Street, Adelphi, W.
5	University of Birmingham Chemical Society: "Drugs and Poisons; the Chemistry of their Physiological Action." A. W. Burtt.	Birmingham.
5	Royal Institution of Great Britain: General Meeting. 5 p.m.	Albemarle Street, Piccadilly, W.1.
5	Institution of Rubber Industry: "Technology in the Rubber Industry." W. A. Williams.	London.
5	Society of Chemical Industry (London Section): Papers by Dr. E. Fyleman, G. T. Bray and F. Major. 8 p.m.	Engineers' Club, 39, Coventry St., W.1.
6	Society of Chemical Industry (Birmingham Section): Discussion on Fuel. 7 p.m.	University Buildings, Edmund St., Birmingham.
7	Society of Public Analysts: Annual General Meeting. 8 p.m.	Burlington House, Piccadilly, W.1.
8	The Optical Society: Annual General Meeting. 7.30 p.m.	Imperial College, London, S.W.7.
9	Society of Chemical Industry (Chemical Engineering Group): "Some Control Formulæ in Connection with Leaching and Evaporating." F. G. Donnan. 8 p.m.	2, Whitehall Court, London, S.W.1.
9	Institute of Metals (Sheffield Section): Special conjoint meeting with the Faraday Society Symposium on "Stainless and Non-Corrodible Alloys." 7.30 p.m.	Mappin Hall of the University of Sheffield.
19 to Mar. 2	British Industries Fair.	London and Birmingham.

The Growing Chemical Industry of Palestine

By Dr. Percy E. Spielmann

Dr. Spielmann has recently returned from a visit to Palestine, Syria, and Egypt. Although he was on a holiday, "once a chemist, always a chemist," and he has given his impressions from the chemical point of view of the progress that Palestine is making.

In order to understand the position of industry in Palestine a short consideration of the internal conditions of the country is necessary. The matter of prime importance is the continual search for the greatest, the very greatest, factor common to the three great races of divergent characters. There are, firstly, the Arabs, a people intelligent and uneducated, excitable, childlike, and pitiably credulous; then the Jews, intelligent, on the whole well educated, enthusiastic, and capable; then the Christians and the American Christian Arabs, of good education and energy and with capital to push their ideas.

The Arabs are very conservative in their methods, often employing the same appliances of industry as were used in Biblical times. Some are suspicious of the activities of their more progressive neighbours, and not unnaturally resent their presence and their increasing numbers. This suspicion is fostered by the occasional sale to the Jews of land by the Arab landowner over the head (or, rather, under the feet) of the fellaheen, who at once complain that they are being dispossessed. It is on account of the unique conditions—racial, religious, and economical—of Palestine that such happenings are watched with almost fanatical jealousy, so that much noise is made about what elsewhere would be scarcely noticed. On the other hand, time is showing that the fears, put into them by agitators and certain disgruntled individuals who can no longer make money as they did in the time of the Turkish domination, of their ultimate displacement and of the complete control of the country by the Jews, are baseless. They will also find, as the Government is losing no opportunity of declaring, that they are being led to co-operate with the remaining Palestinians for the successful future self-government of the country.

The Arabs will see that the presence of more highly trained workers will not endanger their position in Palestine, as the newer methods will give them a model to which to turn when changing from their own archaic ways; and that the increased efficiency in winning "the fruits of the earth" will lead to the increased prosperity of all. They will realise that even competition will not crush them, and that they are being treated with a consideration not usually shown. Industrially, as in other directions, development will not be by internecine strife, but by co-operation of all sections of the inhabitants.

This is the more likely, as the Arabs and Jews of the country side, when left to themselves, get on in a perfectly friendly way; it is in the towns where the narrower and nasty forms of politics can flourish that there is dissension and occasionally strife. But even so, the true picture of Palestine is that of a quiet, peaceful country with occasional local and short-lived ebullitions.

With these points in mind it is the more easy to understand the transitional stage of the industry of the country, the source of impulse towards improvement, and the general way in which this is regarded. It must be realised that Palestine is a small country: it is a summer day's motor run from north to south, and half a day's travel from west to east—"from Dan to Beersheba," from the Mediterranean to the Jordan.

The works about to be described represent the more important chemical industries; most of these, and others as well, have been visited personally, and all information is from unquestionable sources.

Vegetable Oils.—At the present time olives, preferably from the north, and sesame seed are used, and the oils produced are claimed to be superior to those of Egypt The ordinary process is employed of crushing followed by hydraulic pressure, separation of water by gravity and filtration, when necessary, through canvas bags. The residue from the sesame seeds is compressed for cattle cake, and that from the olives is employed as a fuel which is valued for the high temperature which is obtained from it.

A small factory may turn out on an average 250 kgs. of oil (and 200 kgs. of soap) daily and employ 8–10 hands. A new company, the "Shemen," with a capital of £250,000, is erecting a factory and stores at Haifa (Fig. 1), and expects to employ 120–160 hands. Olive oil and the whole of the sesame production is to be handled, and later on castor oil and perhaps cotton seed oil will be produced.

In many places the ancient method is still employed by the Arabs. A stone pedestal forms the lower grindstone, whilst the upper, which is weighted to about 600 lb., has a central hole to receive the cleaned and heated seed. This is revolved by means of a beam of wood, one end of which fits into a socket in the stone and the other is attached to a camel or mule. The animal is blindfolded, and walks continuously in its circular track. To just such a mill was the blinded Samson harnessed by the Philistines. The oil runs out into a groove in the lower stone and down through a hole to be collected, and is not treated further. The residue is placed in a receptacle rather like a cottage "copper," and is trodden by men into cake. Five men can produce about 200 kgs. of oil in a full working day.

Soap.—Excellent soap is manufactured from olive oil, mainly at Nablus (the Biblical Shechem) and at Jaffa. It is well liked in the country, and much is exported; most of the soap of Egypt is Palestinian.

The usual caustic soda saponification is carried out, and the final product is either poured on to floors or into big wooden moulds that can easily be taken apart. It is then cut into shape and either stacked in open pyramids or ranged on shelves to dry for one or two months, as a hard soap is demanded.

The oil usually reaches the soap factory in steel drums, which have displaced the older wooden barrels; but to the Arab factories it is still delivered in goat skins. The soda is mainly obtained from England and Belgium, the former being preferred. The glycerin is not recovered. A peculiar custom at Jaffa is to pay the men so much per boiler operation, the currency being soap, which they then sell in the bazaars. At Haifa glycerin and cocoanut soaps are also produced, from purchased materials.

The total production is estimated (by the trade) at a maximum figure of 7,000–8,000 tons per annum. The actual figures for 1920–21 were approximately 88,500 hectolitres of oil.

Candles.—A successful undertaking, the "Sahar" factory, employs modern machinery and produces 1½ tons per day with about 50 hands. New machines that are on order will double the output. The stearine is obtained from America and Galicia.

Silicate Bricks.—The Palestine Silicate Co., with a capital of £E75,000, are manufacturing sand-lime bricks at Tel-Aviv, a Jewish suburb of Jaffa. The sand is obtained from outside the factory, and the chalk comes about 30 miles by rail from Artuf. The firing of the boilers will shortly be changed to oil.

The output is 40,000 bricks a day by one shift, or 60,000 by two shifts of 150 hands. There is a great demand for these bricks, as building is going on very actively in Palestine. The manufacture of "Tonolite" cement-asbestos tiles has recently been begun, and 8 men and 2 women produce 2,000 tiles in one shift of eight hours.

The factory is an excellent example of modern practice and one which would be a credit to any European town.

Salt.—An interesting development is that of the Palestine Salt Co., which is very nearly ready to operate—the first pump was being tested at the time of my visit. The works are situated at Athlit (Fig. 2), famous for its association with the Crusaders. Remains have been found that may have been ancient salt pans; and, indeed, the ground is found to be specially suitable for retaining salt water during evaporation.

The works, the preparation of which has involved the drainage of unhealthy swamps, have been calculated for a production of 50,000 tons a year. They consist, first, of the enclosure of two contiguous areas, totalling 350,000 m² in area (as told to me, but given as 550,000 in a Report), where preliminary sedimentation and evaporation is to take place. The brine will then be pumped into 18 smaller "basins,"

floored with wood, totalling 250,000 m², where final evaporation will take place. The salt will be ground and purified, and the whole process is expected to take four months.

The enclosing wall of the " basins " consists of a double wooden wall with about 4 ft. intervening space, braced together every few feet, and filled with pressed earth.

In the Dead Sea area salt is obtained by the Arabs by impounding a pond full of the salt water and allowing it to evaporate (Figs. 3 & 4). After a time the solid salt is bagged and carried away on camels. Farther south rock salt is to be obtained crystallising out as such. Although as an " industry " the process and conditions are very primitive, yet this is undoubtedly a valuable area for future exploitation.

Of the lesser industries several must be brought forward.

Mineral Oil.—Very naturally the results of recent borings are not to be ascertained, but I have been informed that members of the staff of the Standard Oil Co. have expressed themselves very satisfied with the indications that have been obtained.

Perfumery is being developed on a highly scientific basis. At Zichron-Jacob, not far from Haifa, a fully equipped central research laboratory, under Mr. Kheifetz, has been established and is nearly finished. From here the technical work of the various localities will be directed, and chemical processes will be worked out. Already various areas of tuberoses, roses, jasmine, etc., have been planted, and the extraction of aromatic oils from eucalyptus and mimosa is being carried out in order to test the excellence of the local sources. There appears to be every reason why this industry should develop.

The firm of Gourarié et Fils, of Jaffa, are making a plucky effort to recover their position after their works have been destroyed by the Turks during the war. They are restarting the preparation of toilet perfumery by hand until they are able to re-install machinery.

Closely allied to this is the *Lemon industry*, for which plans are developing for the production of concentrated lemon juice, lemon oil, citric acid and calcium citrate.

Other industries, which include *Tanneries*, *Alcohol distillation*, *Lime burning*, are numerous but small, and there is the long established American-Palestine *Iron works*, which makes pumps, suction gas plants and other such machines. It employs 40 hands, and it is interesting to note that they find that the Arabs make the best foundrymen and the Jews the best fitters and smiths.

So far there is no trace of a *Dye industry*. All that is done is to dye locally woven fabrics with colours from Germany—usually indigo, dark red, yellow and orange.

Suitable conditions in the future could augment considerably the industries of the country. *Salt* and *Potash* exist in enormous quantities in the Dead Sea valley, and transport deficiencies prevent their exploitation except by the Arabs in very small quantities. If this could be overcome, *Sulphur* and *Bitumen* would also become available. *Phosphates* occur also in Palestine in, I believe, available positions.

A sufficient number of raw materials exist for the manufacture of *Matches* for it to be anticipated that this industry would, from the technical side anyhow, not be difficult to establish.

Based on the variety of soils and altitudes which can be chosen in Palestine, *medicinal plants* could doubtless be successfully raised.

Cement works are to be erected shortly; and there is little doubt that *Glass* could be manufactured. I understand that one attempt which failed was unsuccessful owing to insufficient preliminary investigation. The native methods of producing

FIG. 1.—" SHEMEN " OIL FACTORY. THE TURKS HAD DESTROYED MOST OF A BEAUTIFUL PALM GROVE, SO THAT IT WAS DETERMINED THAT NO MORE SHOULD BE CUT DOWN. THE TREE SEEN IS BEING ALLOWED TO REMAIN AND GROW THROUGH THE FACTORY.

FIG. 2.—SALT WORKS AT ATHLIT. POWER HOUSE, WITH WOODEN " AQUEDUCT " ON THE EXTREME RIGHT, AND CRUSADER RUINS ON THE LEFT.

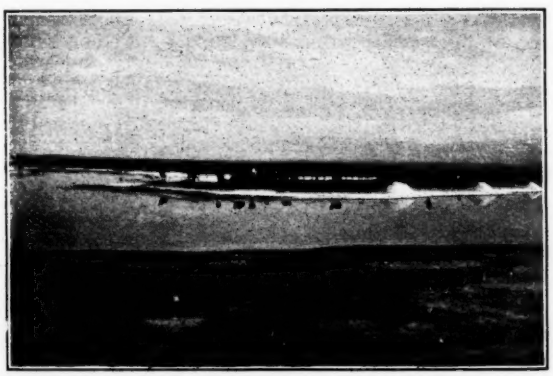


FIG. 3.—SALT IN THE DEAD SEA AREA. ARABS COLLECTING THE EVAPORATED SALT. THE OBSERVER IS LOOKING UP THE VALLEY TOWARDS JERICHO AND HAS THE DEAD SEA JUST BEHIND HIM.

FIG. 4.—SALT IN THE DEAD SEA AREA. SOLID CRYSTALLISING OUT AT THE EDGE OF THE POND SHOWN IN FIG. 3.

coloured glass and beads are peculiar, and would repay examination; this manufacture is in a flickering condition in Hebron.

Although it is outside the strict scope of this article, attention should be drawn to the *Agricultural Experimental Station* at Tel-Aviv (Jaffa). This is as admirable a scientific organisation as one could wish to see. It is, of course, on a small scale, but it is as complete as is necessary. It is experimenting in the most detailed manner, in the improvement of crops and of oil-bearing seeds: in the growing of tobacco (a very promising industry in the near future); in the improvement of milk-production; in the combating of insect and other pests; in the growing of silk-producing worms on castor-oil leaves, and in many other problems of this kind.

The general impression that is left on the mind regarding the industrial position is one of optimism. Considerable progress has been made in the face of great difficulties—occasional anti-semitism, continuous political intrigue and shortage of money, and, most particularly, delayed ratification of the Mandate and, therefore, postponed election of the Legislative Assembly. In spite of all this, established works are continuing, archaic methods are improving, new enterprises have started and are about to start. There is a general feeling of energy and enthusiasm straining to be released, and that release will come in proportion as the hindrances enumerated disappear and the general world slump becomes righted. I believe that the hopes for the general success of Palestinian enterprise are well founded.

Fine Chemicals at the British Industries Fair

Continued Progress in Home Production

The following preliminary notes on the Fine Chemical exhibits at the forthcoming British Industries Fair indicate the appreciable progress in home production which has taken place in recent years. The date of the Fair is Monday, February 19, to Friday, March 2. Special issues of THE CHEMICAL AGE, *describing the features of the chemical section, will be published on February 24 and March 3.*

IT will be of particular interest to foreign buyers visiting the British Industries Fair to know that many Fine Chemicals, including pharmaceutical and photographic chemicals, hitherto available only from abroad, are now made in the United Kingdom.

Fine Chemical manufacturers in the United Kingdom realise the importance of attaining the highest possible standard of quality, and have paid so much attention to this point that their products have been pronounced at least equal, if not superior, to the pre-war products of foreign countries. More than two thousand Fine Chemicals are now manufactured in the United Kingdom, and of this number many of the most interesting and vital types will be represented in the exhibits at the British Industries Fair.

Medicinal and Pharmaceutical Chemicals

Probably no better example of the supreme importance of science to the welfare of the nation can be found than in the application of scientific research to the production of *Fine Chemicals used for medicinal and pharmaceutical purposes.*

As far back as 1904, for instance, a series of investigations on the chemical composition of chaulmoogra oil was begun in a British laboratory, and has been continued patiently and laboriously. At first, apparently, almost wholly of academic interest, these researches have had an important practical outcome, which is to be seen to-day in "Moogrol," the latest and most promising of remedial agents for that ancient scourge, leprosy.

Equally striking as evidence of the skill of British chemists and the vitality of the British Fine Chemical industry are "Kharsivan" and "Neokharsivan," the British products which, within a few months of the outbreak of the war, replaced German salvarsan and neosalvarsan.

The same manufacturers who produce the foregoing preparations have been pioneers also in the "gland" treatment, of which so much has recently been heard, and they will exhibit specimens of "tabloid" products of thyroid, pituitary and various other glands, including a new "mixed glands" product from which much is expected.

A considerable portion of this exhibit will be devoted to the display of the results of the most recent advances in that other branch of scientific medicine which deals with sera, vaccines, and allied substances. Among the most up-to-date of these are vaccines for the prevention and treatment of influenza and "colds."

Of no less interest than such severely scientific exhibits will be certain "tabloid" preparations of mineral waters which literally bring to the home all the beneficial properties of spas like those of Carlsbad, Vichy, etc., while "Sketofax," an antiseptic cream, designed to ward off the attacks of gnats, mosquitoes, and other insects, some of which convey diseases, will serve as a reminder of the infinite number of directions in which the chemist can contribute to the comfort and security of life.

Analytical and Research Chemicals, etc.

Another firm, employing upwards of 1,000 persons, manufacture a complete range of pharmaceutical products and of laboratory chemicals, and will exhibit about 400 examples of such chemicals for pharmaceutical, analytical, and research purposes.

Microscopical Stains.—A supply of standard dyes or stains of absolute reliability is essential for microscopical work. The exhibits in the Fine Chemical Section of the British Industries Fair will show that a complete range of pure British-made standard stains is available. A leading United Kingdom firm of Fine Chemical manufacturers undertook this manufacture during the war, and have laid down a small dye plant and organised a special department for their production. These stains are of great purity; they have been thoroughly tested by leading microscopists, and approved by them as being of greater purity and uniformity, and therefore of greater reliability, than the pre-war German products.

Analytical Reagents, Research Chemicals, etc.—The great importance of these particular chemicals, which are used in all laboratories where scientific investigations are conducted, is universally admitted.

The remarkable enterprise of one exhibiting firm has now resulted in the production of upwards of 3,000 different chemicals, each one of which after its manufacture has been carefully analysed by a member of the large staff of chemists employed by the firm.

Glucose (Pure Surgical).—Commercial glucose, made on the large scale by the fermentation of starch and used for a variety of purposes, is a well-known article of commerce. Pure glucose is quite a different product, and, before the war, this "fine" quality of glucose was obtained from Germany. Very soon after the outbreak of war the manufacture of this substance was undertaken in the United Kingdom. The manufacture then begun has since been steadily pursued and has been placed on a sound basis on an industrial scale, and the needs not only of the whole of the United Kingdom, but, in addition, those of Colonial and neutral markets, can now be supplied.

The chief use of the particularly pure glucose is in medical and surgical practice. Injected intravenously in surgical operations in the course of which there has been great loss of blood, it prevents shock and collapse.

Hydrogen Peroxide (Pure).—A pure, stable, and non-irritating hydrogen peroxide will be shown, and the firm producing it is to be congratulated on having successfully overcome the technical difficulties involved, as well as in initiating a new process. The commercial article, though adequate for all common uses, is far from satisfactory for medicinal and surgical processes on account of its irritating and unstable character. This present product, known as "Duogen," is of especial value as a mouth wash in preserving the teeth and as a safeguard against infection.

Electro-osmosis

Electro-osmotic Purification.—One interesting exhibit will be that illustrating the results of electro-osmotic purification of different raw materials. The process consists essentially in causing solid particles to deposit in a coherent form comparatively free from liquid, on an electrode or intervening partition of semi-pervious material. In mixtures of particles of different nature such as sand, clay, chalk, or of particles of different physical properties such as granular particles and colloidal particles, the particles deposit more or less quickly at the electrode, or, if they have no electro-osmotic properties, they do not deposit at the electrode at all.

By electro-osmotic methods it is possible to obtain substances in a physical condition and degree of purity which are unattainable by the ordinary chemical processes.

A vast field of development is being opened up by the application of electro-osmotic methods in the Chemical and Allied Industries.

Fine Chemicals in Industry

Photographic Chemicals.—The years following the war have seen a phenomenal increase in the United Kingdom output of photographic materials. In 1914 consumers in the United Kingdom were dependent on supplies from abroad for a great many photographic materials, but at the present time Metol developer—which is essential to all X-ray surgical work—amidol, silver nitrate, etc., are produced by United Kingdom manufacturers in the requisite quantities and at prices which favour the consumer. It may be pointed out as of interest that the Shackleton expedition was completely furnished with photographic materials of United Kingdom manufacture, and these materials will be exhibited by the manufacturers at the Fair.

Industrial Bleaching.—Amongst the exhibits of United Kingdom chemical manufacturing firms in Hall A will be found a most interesting collection of hydrosulphite compounds, together with samples of products which have been bleached by them. Sodium hydrosulphite is a white crystalline powder of very great bleaching power. It is already used in vat dyeing, in sugar refining, in laundering, in the manufacture of pharmaceutical chemicals, and in the bleaching of cotton, wool, silk, oils, glycerin, glue, gelatine, feathers, bristles and straw. Large though this list is, there will be many other industrial bleaching problems in which the solution may be found in hydrosulphite.

Formosul, used as a discharge in calico-printing, is a compound of hydrosulphite and formaldehyde, whilst zinc formosul, a zinc formaldehyde hydrosulphite, is a powerful reducing agent much used in the " stripping " of colours, and during the process of fat-splitting and glycerin bleaching.

The manufacture of these materials is now an established industry in the United Kingdom, and research on the part of the British producer has not only resulted in a product at least equal to the German but has enabled substantial reduction to be effected in the price.

Purity of Products

A notable achievement by United Kingdom chemical manufacturers is the raising of the standard of purity of many of their products. One firm is showing, for instance, ammonium bi-phosphate and carbon tetrachloride of a purity reaching the highest standard demanded for research purposes, and yet these are quoted at the ruling market rates for the higher commercial grades.

Another of their exhibits is 99 per cent. pure persulphate of ammonia, quite stable and remaining dry in air, even when ground to 120 mesh.

The same firm has some quite new exhibits, including a crystalline variety of phosphoric anhydride.

Sands and Salts

Monazite Products.—An interesting exhibit will consist of specimens of Monazite sands from various parts of the world, thorianite and thorite; thorium and cerium nitrate for the manufacture of gas mantles, and a series of rare earth salts prepared from monazite sand. Meso-thorium and self luminous preparations will also be shown. There will also be on view a set of photographs illustrating the exhibitors' monazite works in Travancore, where the mineral is obtained from which thorium nitrate, used in the manufacture of incandescent gas mantles, is produced.

Specimens of uranium salts will be shown—uranium acetate, nitrate and oxide (black), and sodium uranate, largely used in the glass industry for the production of fluorescent glass, etc.

Amongst the other exhibits on this stand will be a set of guaranteed chemical reagents for scientific and research purposes, and barium sulphate for X-ray diagnosis.

Another exhibit of interest to buyers of pharmaceutical and Fine Chemicals will be that of a United Kingdom manufacturer showing a very wide range of both inorganic and organic products.

Mercury salts, which have been produced on a large scale for many years, will form a prominent feature of the exhibit. Pharmaceutical and technical products are included under this heading. Among the former are calomel, mercury bi-chloride, mercury ammonium chloride, mercuric iodide, and mercurial ointment; while of the latter red and yellow mercuric oxides will be shown. These are in demand as they form the basis of numerous anti-fouling paints and compositions. In addition to those mentioned many other mercury preparations of interest to individual buyers will be found.

Of the bismuth salts exhibited, special attention is drawn to the carbonate, subnitrate, salicylate, subgallate and tribromphenolate. In addition to the ordinary product, a specially light carbonate will be shown, one pound of which is guaranteed to fill a 60 oz. bottle. The bismuth tribromphenolate exhibited is absolutely free from smell, which is not the case with some brands sold abroad. Many tons of bismuth salts are manufactured each year and sent to all parts of the world.

Space does not permit mention of all the other inorganic chemicals exhibited, but among those produced on a large scale may be cited potassium iodide, resublimed iodine, molybdic acid, ammonium molybdate, sodium potassium tartrate (rochelle salts), and scale preparations, etc.

Organic Chemicals

Turning to the organic chemicals, chloroform and ether, both anæsthetic and commercial, are available. The anæsthetic qualities are of the highest degree of purity and are consumed in large quantities in the home and empire markets and in many foreign countries.

Strychnine alkaloid and its salts have now been manufactured for some years, and the large demand for these from overseas makes ever increasing production necessary. A particularly fine sample of strychnine nitrate cryst. will be shown, and other products will include cantharidine, arecoline, and yohimbin, etc.

Resublimed camphor tablets and camphor flowers will be exhibited, and it will be noted that the former are absolutely transparent.

" Arsenobillon " and " Novarsenobillon," the British equivalents of " Salvarsan " and " Neosalvarsan " will be shown. These are manufactured under licence from the Board of Trade and are now recognised as the specific treatment for syphilis. Other specialities for the treatment of venereal disease which will be exhibited are " Eparseno " and " Luatol." Stringent physiological tests as to freedom from undue toxicity and as to the therapeutic efficiency are laid down by the Medical Research Council and every batch of " Arsenobillon " and " Novarsenobillon " has to pass these tests before distribution. " Arsenobillon " and " Novarsenobillon " have now been successfully manufactured for the past 5 or 6 years, and are recognised throughout the British Empire as efficient equivalents of the original German preparations.

Another well-known product is planadalin, a synthetic organic hypnotic in general use, which will be exhibited in the form of powder and tablets.

Many products are of course not exhibited, either on account of their objectionable or dangerous nature, but this section of the Fair will nevertheless provide items of interest for both the medical profession and chemists, appealing as it does to every branch of the chemical and allied trades.

" No Higher Praise "

AMONG recent letters of thanks is the following, dated January 22, from a large firm in Co. Cork, Ireland :—

" We beg to thank you for the copy of THE CHEMICAL AGE YEAR BOOK, recently received by the undersigned. We can give it no higher praise than to say it fully reflects the high standard of THE CHEMICAL AGE itself. May we take this opportunity of expressing our appreciation of the service rendered to technical industry by THE CHEMICAL AGE ? "

The Case of the Young Chemist

To the Editor of THE CHEMICAL AGE.

SIR,—I was sorry to hear from "Unemployed" that he attributes his state to us. Teachers spend their time in trying to do their best for students, but it is very infrequently that they receive any thanks. I never engage in controversy for its own sake, but I think your correspondent is entirely wrong, and calls for some reply.

There are, of course, two sorts of chemists and two sorts of employers. Some chemists are careful and accurate analysts, and are more attracted by the thorough course in that branch of chemistry which a University education provides. They are the men for routine work, and usually stay there. Many employers require only this type of man, since they have no desire to extend their business or to open up new lines. On the other hand, some students, in addition to a sound practical knowledge, possess some insight into the really fundamental principles of chemical theory—"hieroglyphics" indeed, since they are the sacred symbols which few can read. These men are sought after by employers who take broad views of their activities and know that the routine man will not see them far along new roads.

I have met many such men in large industrial undertakings, and I believe their employers value them. It would help us if some employers would give an opinion. To save misunderstanding, I may repeat that I think both types of chemist and employer are necessary, and it is the wish of the University teacher to develop his men so as to fit them for what they are likely to do successfully. The statement that the University course caters only for men who will be unqualified to seek works employment is incorrect and mischievous and should be contradicted. I may say that employers take an opposite view. I fear that if your correspondent holds such views his mental condition will be such that he will for long remain unemployed, and my only object in taking up your space is to warn students that his views are definitely opposed to facts.—Yours, etc.,

J. R. PARTINGTON.

East London College, January 29.

[We do not think anyone would attribute the unemployment of chemists to the University staffs who teach them the principles of their science. Whether the young chemist ultimately turns to pure research or to works practice, in either case he must equally need a sound knowledge of fundamental principles.—ED., *C.A.*]

To the Editor of THE CHEMICAL AGE.

SIR,—Recent remarks in your columns on the situation among young chemists and other intending adventurers into the field of industrial chemistry prompt me to take up the pen to state a case on behalf of myself and other undergraduates directly concerned.

First of all, it is common plaint in the ranks of our university that industry has little to offer in these days, and thus large numbers of potential members are moving towards outlets of a more favourable nature. Still there remains a considerable quota who, having set their minds on one objective, generally stick to their guns, despite the harassing and mostunfavourable conditions confronting them. Moreover, to illustrate their sheer activity and keenness to do well, they are, thanks to the ever-increasing volume of sound advice, furnishing themselves, at considerable effort, with first-hand knowledge of methods, technical and financial, of present-day industry. When it is considered that such effort is carried on outside the pale of the university walls, not even with the blessings of those in authority, it is more to be wondered at, and credit is due for at least their enthusiastic spirit and sacrifice.

Still, this does not overcome the difficulty, and it is pretty evident that such indomitable courage cannot survive plain economic truth. In this case it behoves us to regret deeply the meagre response extended by our organisers of chemistry in industry. The various excuses and reasons put forward are continually and monotonously being uttered, extending a hope which is perilously manifesting itself in our minds as being utterly unrealisable. It is, therefore, in duty bound we feel that at this juncture vent might be given to a large and unanimous expression of opinion.

Such expositions laid bare in your journal—*e.g.*, that of the progress of the United Alkali Co., Ltd., and numerous others—resound in their entire tone with their moral lesson of truth as it is. Are organisers in other chemical and allied industries aware of this truth? If so, why don't they act? If not, how came they to be organisers? Teach them by publicity the necessity of scientific application in industry—what irony in these days! A little more introspection, a little more vision, will surely show that a great deal of the "trade revival" must inevitably come from within rather than from without.

However, it is not the intention of this note to raise any heated and inflammatory discussion, but rather to suggest to those with powers the dire necessity of solving an imminent problem and its many attendant evils.

In conclusion, it might be helpful to put forward slight suggestions from a point of view which might be regarded as assisting temporarily in deleting from the ranks of unemployed the numbers of chemists and others in the special sphere :—

(*a*) Closer co-operation of technical and financial control of industry; co-ordination of effort to obtain "best available" means of production and distribution.

(*b*) Intensification of following industries :—

1. Low temperature carbonisation of coal. (In this colliery companies might take a more steady lead.)

2. Fertilisers with special development of synthetic nitrogen processes (considering available water power in our own country).

3. Stricter and efficient utilisation of oil fuel, raw materials and products.

(*c*) Further development of home markets and Dominions.

(*d*) Recognition in all manufacturing and industrial processes (semi-chemical and non-chemical as so far thought to be) of the need of trained men in chemistry in the administrative or advisory capacity.

Thanking you for your tireless efforts on behalf of the younger school.—Yours, etc.,

S. G.

Edinburgh.

To the Editor of THE CHEMICAL AGE.

SIR,—As a constant reader of THE CHEMICAL AGE I was glad to see your article on the "Young Chemist," which appeared last week. I am a young chemist with an honours degree in chemistry of London University (external), but with no works experience. The neighbourhood in which I live contains few factories and only one or two which keep chemists.

As you state you have found employment for one or two, I wonder whether it will be out of your way to try and do something for me. If you would try and help me, I could do with a little advice on how to "commence" to look for a post.—Yours, etc.,

H. L. T.

Southampton, January 31, 1923.

To the Editor of THE CHEMICAL AGE.

SIR,—With reference to your leader in THE CHEMICAL AGE of January 20, on employment of chemists, I have been out since June last, and from then have not had a single penny of income. In view of the fact that I have been a regular reader for a considerable time I would ask your valued assistance in obtaining a suitable introduction. I enclose a copy of my record, and should be glad to furnish you, should you wish, with references as to my standing, etc. Thanking you in anticipation.—Yours, etc.,

W. L. C.

Birmingham, January 27, 1923.

To the Editor of THE CHEMICAL AGE.

SIR,—Having seen in your last edition that you have been successful in securing posts for young chemists, I am taking the liberty of asking for your advice and assistance. I am 21½ years old, and, having graduated in 1921 with first-class honours in the University of Liverpool, I took my M.Sc. last year, after a year's research in chemistry. Thanking you in anticipation for your esteemed advice.—Yours, etc.,

R. S. J.

North Wales, January 29, 1923.

Chemical Manufacturers' Quotations

To the Editor of THE CHEMICAL AGE.

SIR,—Can any of your readers explain to me the following very puzzling state of affairs :—

I recently sent for quotations for chemicals to four different firms of chemical manufacturers and carefully specified the quality of materials required. I received the four quotations, which showed the most extraordinary divergence ; for instance, firms A, B, C and D quoted for :—

Material.	A	B	C	D
Potassium Iodide BP..	16/2	19/6	19/6	16/2
Iodine	19/4	28/-	22/-	21/-
Sodium peroxide ..	2/6	4/6	4/9	2/9
Bromine	3/4	9/-	6/-	-/11
Dimethyl-glyoxime ..	7/- oz.	11/6	9/-	8/6
KOH by alc.	3/6 lb.	13/6	6/1	3/-
H_2O_2	2/6 lb.	4/10 lb.	4/- lb.	6/6 gall.

Why this wide divergence, since the specifications were very definite ? These items are taken at random, the same inconsistency appearing in all items. I know of no other trade where such diverse prices are quoted for one and the same thing.—Yours, etc.,

REGINALD G. JOHNSTON,
Scientist in Charge.

Midland Laboratory Guild, Ltd., Birmingham.
January 27, 1923.

Colouring Poisons

To the Editor of THE CHEMICAL AGE.

SIR,—Zinc-free methylene blue seems more suitable for colouring poisons than the dyes named in a recent note in your journal concerning some recommendations made. The shades obtained from methylene blue are distinctive ; they are quite unlike those of any ordinary food or drink, whereas green, magenta and violet colourings do occur. A second advantage is the greater fastness to light. A third is the easier separation of this colour during analysis. The basic colours generally are removed completely from solution in water by earths such as fullers earth, but methylene is the only common one amongst them not removed from the earth by alcohol. This resistance to alcohol would appear to be a very substantial advantage.—Yours, etc.,

4, Albert Square, Manchester. E. F. MORRIS.
January 25.

Chemical Salesmanship

To the Editor of THE CHEMICAL AGE.

SIR,—I read with interest your article on "Chemical Salesmanship" in the current edition of THE CHEMICAL AGE. The need for a Chemical Salesmen's Association is as important to the purely commercial man engaged in the selling of chemicals as to the chemist. A combination of both commercial and chemical knowledge is necessary to overcome the intricacies and pitfalls of chemical salesmanship, and also to enable the salesman intelligently to present his products to the prospective buyer.

Among the large number engaged in the British chemical industry there are many who possess a life's experience of chemical trade. In the interests of the industry I am sure they would be willing to allow the wisdom of their age to blend with the courage of the more youthful members of the profession. An association such as you suggest would materially assist to keep the British market for British manufacturers.—Yours, etc.,

January 29, 1923. "GEE."

A Chemical Engineering Query

"I am writing you this letter in order to take your advice as regards the best institution in chemical engineering for advanced work. I am a B.Sc. in technical and general chemistry and intend to specialise in chemical engineering. What is your opinion as regards the work of the Imperial College of Science and Technology ?"

[You cannot do better than get into touch with Professor J. W. Hinchley, Professor of Chemical Engineering at the Imperial College of Science and Technology, and hon. secretary of the recently formed Institution of Chemical Engineers.—ED. C.A.]

Qualifications of Gas Examiners

Institute of Chemistry's Action Approved

THE action of the Institute of Chemistry in demanding adequate qualifications in the case of gas inspectors is warmly approved by *The Gas World*, which, in an article on the subject, says :—

"Very early on in the administration of the Gas Regulation Act we divined that the question of the status of gas examiners was bound to come to the front. We endeavoured to expedite the process in the conviction that it was better to create a satisfactory testing personnel with as little delay as possible rather than the appointments should be made more or less indiscriminately amongst men whose competence might reasonably be queried. . . . After fifteen months there are signs that the conviction is taking root in other quarters that something must be done to establish the vocation of gas examiner on a respectable footing. At the Therm Charges Committee meeting last week, Mr. G. S. W. Marlow gave the views of the council of the Institute of Chemistry on the qualifications considered necessary in gas examiners. Without repeating the details, it may be said that Mr. Marlow's evidence more than justifies our earlier predilections. In his view the Act will become a dead letter unless gas examiners are properly qualified. Already persons, having no special knowledge or experience, have been appointed to these positions, and 'there appears to be no mechanism whereby the suitability of apointments made can be challenged.' Mr. Marlow also impugned those cases, as unlikely to result in impartiality, where the servants of local authorities have been appointed. Mr. Butterfield, giving evidence as a Gas Referee, said they had no power in the matter, but had to accept the person appointed by Quarter Sessions—'all types of men had been appointed'—and he expressed the view that it would be better to have a well-trained man in all cases. Here we have, then, testimony from two unimpeachable sources that there is a serious flaw in the process by which men become gas examiners without any warranty of competence. Is it, or is it not, a matter of importance to the gas industry ? Should action be taken to put the defect right, or should it wait upon actual experience of the administration of the Act ? These are questions that those who direct the industry must put to themselves. If the competence of a gas examiner can be challenged it provides a possible good defence in case of action for penalties, but that is poor justification for a policy of drift."

Dr. Carpenter and Gas Examiners

In the course of his evidence before the Committee on Friday, January 26, Dr. Charles Carpenter said that the qualifications of gas examiners should be prescribed, but he thought the result would be that a sufficient number of persons qualified to carry out the duties would not be obtained. The more highly qualified the gas examiner the better it would be for the industry, but he should be skilled in the handling of physical and chemical apparatus. The Gas Referees were better qualified than anybody else to lay down the conditions considered necessary for the qualifications of examiners.

Mr. Woolcock : Would it be true to say that half the apparatus of the London companies is out of date ?

Dr. Carpenter : No, no.

Mr. Woolcock : We were told so.

Dr. Carpenter : That must have been told you by someone not acquainted with London apparatus, or who had not taken pains to get acquainted with the facts. The best thing would be to see what the apparatus is doing.

At the commencement of the proceedings the chairman announced that a letter had been received from the British Association of Chemists in which the Association claimed to have a voice in the appointment of gas examiners. The letter would be placed on the minutes of the Committee for reference.

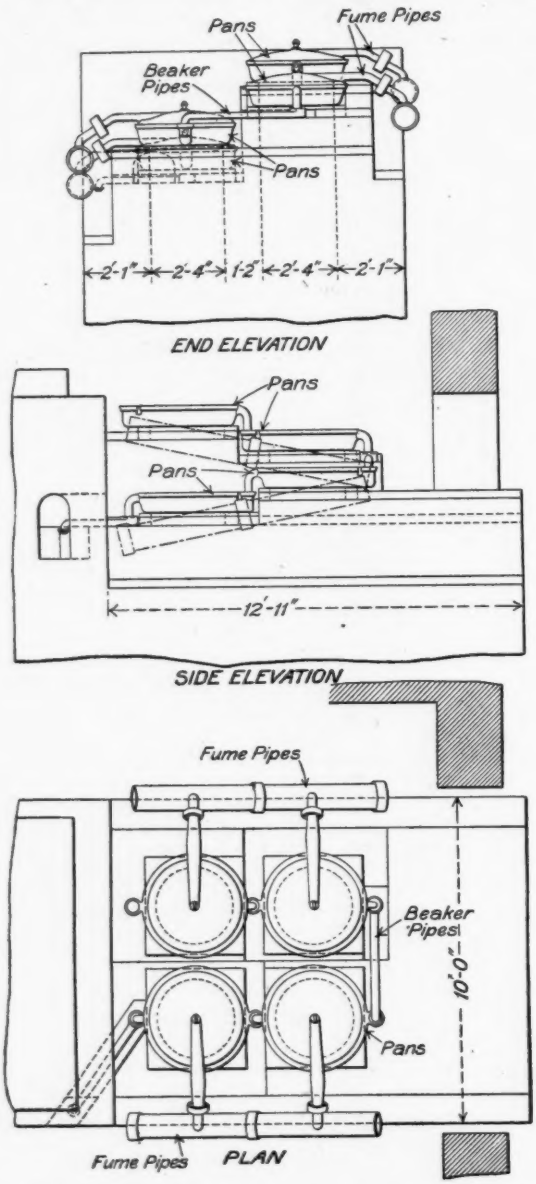
Chemical Merchants' Losses

THE statement of affairs submitted to creditors in the voluntary winding-up of J. M. Roller and Co., Ltd., chemical merchants, of Hull, shows unsecured creditors for a total amount of £3,125, and a deficiency of £2,555, which includes £445 due from J. M. and J. P. J. Roller. The liquidator is Mr. Stanley Scotter, accountant, 13, Bowlalley Lane, Hull.

Sulphuric Acid Plant Improvements

Notes on some Recent Installations

It may be of considerable interest to readers who have followed the Review Article in December 30 issue by Mr. P. Parrish, and also the further article on page 25 of the issue of January 13, to know that Mr. Sydney J. Tungay has installed a series of vessels at a large Continental works, with a view to economically producing a strong, clean acid of 96% to 98%.



There is no doubt that of the varying systems of concentration of H_2SO_4, all have their peculiar and different applications according to the requirements of particular industries. In the case of one Continental works with which the writer has recently had to deal, a continuous supply of 96% to 98% H_2SO_4 of adequate purity was required and this was obtained by adapting the setting, as shown, from a former platinum installation for the distillation of sulphuric acid, and arranging a series of four circular Ironac metal capsules or covered pans, in such a way that the acid flowed by gravity through the system. This is really a gravity distillation plant arranged in series; or it might perhaps more properly be described as a combination of concentration and distillation.

It will be seen from the accompanying illustrations that each of the four pans is so arranged on the old platinum still settings that the acid enters pan No. 1, and after concentration enters pan No. 2, where it is further concentrated. In pans Nos. 3 and 4, distillation of the acid takes place, and the products of distillation are recovered through fume pipes running along the front of the setting—whilst the fume pipes at the back of the setting carry off water vapour and weak acid fumes from the initial or concentrating side of the installation.

This arrangement was designed for the production of a continuous daily output of clean concentrated acid, and to replace a very costly installation of platinum stills, which was dismantled at the commencement of the war period.

Very good results indeed have been obtained from working these pans, and whilst the subject of the production of strong sulphuric acid is before our readers this scheme would seem to be of very considerable interest.

Institution of Chemical Engineers

Sir Arthur Duckham elected First President

The first meeting of the Provisional Council of the Institution of Chemical Engineers was held on Wednesday, January 10, at 166, Piccadilly, London, W.1. According to the Articles of Association, the seven signatories to that document, together with the honorary officers, constituted the Provisional Council, but it was agreed that the Provisional Committee should always be called, so that its members, other than those who are members of the Provisional Council, should act as advisory members thereof.

The solicitor, Mr. E. M. Bonus, of Holmes, Son and Pott, Capel House, New Broad Street, London, reported that he had received from the Board of Trade the Certificate of Incorporation, and the order of the Board of Trade giving authority for the Institution to commence work.

Mr. W. J. U. Woolcock and Mr. F. A. Greene expressed the feelings of friends of the Institution by suggesting that a hearty vote of thanks be extended to the Chairman and members of the Provisional Committee for their untiring efforts in bringing the organisation to a successful issue.

Sir Arthur Duckham, K.C.B., M.I.C.E., was elected unanimously as the first President of the Institution, and Mr. K. B. Quinan and Dr. C. C. Carpenter were unanimously elected the first Vice-Presidents of the Institution. Professor J. W. Hinchley was elected Honorary Secretary, and Mr. F. H. Rogers Honorary Treasurer.

The President announced that he would have great pleasure in presenting the Institution with its Seal, and a hearty vote of thanks was extended to him for his generous offer. It was agreed that the design of the Seal and of the Certificates of Membership be left in the hands of the President and the Hon. Secretary.

It was decided to hold the first annual corporate meeting of the Institution in London on March 14, at 3 p.m.

A list of names approved for election to membership and associate-membership was submitted by the Provisional Committee. After consideration, the gentlemen whose names appeared on the list were formally elected. The Selection Committee, consisting of Mr. J. Arthur Reavell (chairman), Professor J. W. Hinchley, Mr. F. H. Rogers, Dr. E. W. Smith, and Mr. William Macnab, was then elected.

The question of taking part in the British Empire Exhibition, 1924, was favourably received, and a committee consisting of Sir Arthur Duckham, Mr. C. S. Garland, M.P., Mr. S. G. M. Ure and Professor J. W. Hinchley was elected to discuss the question with Mr. Woolcock. On account of his valuable services in the formation of the Institution of Chemical Engineers, and of his work generally in the interests of chemical industry, Mr. W. J. U. Woolcock was unanimously elected an honorary member of the Institution.

The next meeting of the Provisional Council was fixed for Wednesday, February 21, at the offices of the Institution.

Affairs of Chemicals and By-Products, Ltd.

At a meeting of the creditors of Chemicals and By-Products, Ltd., on Tuesday, the liquidator said the statement of affairs at January 11 showed gross liabilities of £23,756 14s. 7d. It was estimated that the assets would produce £4,101 12s. 8d.

Naphthalene in Coal Gas

Various Methods of Elimination Described

MR. A. TROBRIDGE presided at a meeting of the Newcastle Section of the Society of Chemical Industry, held on January 24, when a paper on "Naphthalene in Coal Gas, and Its Removal," was read by Mr. B. Richardson, of the Tynemouth Gas Co.

The author presented the difficulties attending war-time practice so far as naphthalene trouble was concerned, and mentioned that ten grains of naphthalene crystals could completely choke a half-inch pipe for a length of nearly a foot, a fact which indicated the necessity for its elimination. He considered that vertical retorts produced considerably less naphthalene than horizontals. It had also been observed that when excessive volumes of inert gases were drawn into retorts by leaks, etc., naphthalene invariably made its appearance in increased quantities, the presence of nitrogen evidently favouring its formation. The type of coal used for gas making was also a determining factor in the productions of naphthalene. He briefly reviewed the various methods adopted for its elimination or removal, "shock" cooling, volatilisation into the gas stream of oils to dissolve naphthalene, etc. He thought, however, that it was generally recognised that the most efficient and reliable means to adopt when dealing with the naphthalene question was to remove the offending compound from the gas before it left the works by treatment with a solvent which might be naphthalene, free creosote, anthracene oil or oil employed for carburetting water gas. Water gas tar had also been employed, but he did not recommend its use. Whatever solvent might be employed it was essential that prolonged and intimate contact must be effected between it and the gas, as the partial pressure exerted by the naphthalene to be removed was exceedingly small. The most efficient type of apparatus to employ was a mechanical rotary washer scrubber through which the solvent and gas travelled in counter current fashion.

It was practically impossible to effect complete naphthalene removal by bubbling the gas through an oil seal in a Livesey type of washer. The contact time was so short that the efficiency of extraction was extremely low. Tests carried out on an installation of that description showed that at no time was the efficiency of removal greater than 56 per cent., and it was frequently below ten per cent. when the oil employed was not more than half saturated with naphthalene. Creosote oil had proved itself an excellent medium and even war-time benzol plants were being successfully employed.

A discussion ensued in which the Chairman, Dr. W. B. Davison, Dr. G. Weyman, Messrs. F. H. Walker, F. Cooke, and W. Greenfield took part, and to which Mr. Richardson replied.

The Chemical Warfare Problem

Major V. Lefebure on the Need of a Policy

THAT the situation the world over in regard to chemical warfare is entirely unsatisfactory was the belief expressed by Major V. Lefebure, in the course of a paper entitled "Chemical Warfare: The Need of a Decision," read before the Manchester Literary and Philosophical Society on January 26. He attributed the position to insufficient discussion, and the lack of a definite policy, as the result of which the issues were clear neither to the general public, nor even to all chemists.

The present situation, said Major Lefebure, was somewhat akin to the recent case where the need to foster the synthetic organic chemical industry before the war was repeatedly urged by eminent chemists, national action being compelled only by reasons of dire necessity on the outbreak of war.

Major Lefebure claimed most emphatically, that unhampered and vigorous development of chemical warfare by the Powers contained such possibilities that every effort should be made to prevent its development. If the conclusion of those most competent to advise was that no control was possible, our efforts must be extended on a plan co-ordinating all the national forces and activities concerned. Only one of two courses could be supported—either thorough control or the development consistent with the importance of the subject and with our place as a world Power. It was the duty of chemists to agitate until this matter was brought to a head. Never before had such a great responsibility been so clearly incident upon a small, feebly organised, professional scientific group.

The great importance of chemical warfare, said the lecturer, was due to the cumulative effect of a number of reasons. Decisive surprise was one; the odds were that if Germany could have started the war with the knowledge and means of chemical aggression which she possessed in July, 1917, she would have finished the campaign in a few days or weeks. Chemical warfare was by far the best method of achieving decisive surprise in the present state of military development, and was likely to remain so for many years. Explosives were local in their action; the war chemical, acting in minute quantities productive of certain specific reactions in the human organism, was not. At every point where time, manpower, and mechanical power were important, the war chemical had an incalculable advantage.

Protective Measures

The preparation of protective measures against gas was not easy. The use of gas by the Germans was a continuous example of chemical attack upon new human functions; when we protected our men's lungs and respiratory channels, the Germans simply went for another function. No one could place a limit on the possibilities of such development.

Chemical attack on human functions was in its infancy, and a few years of steady, secret development during peace might find a nation in possession of a new casualty producer having some entirely new effect on the human organism, against which there was no defence, and against which the development of defence might take years of patient study. No other field of armament presented such possibilities, and one could not think of any other practical possibility which would be such an overwhelming advantage that its possession would mean certain success at the outbreak of war.

Development or Control?

It was physically possible to stimulate the development of chemical warfare. If we spent wisely on work of this sort, two millions instead of two thousands, we should have a far better chance of obtaining results. The chance of checking development was not large, for no one simple measure would do that. If disarmament in this field were desired, there was much thinking still to be done by chemists and others. The idea voiced, the speaker believed, by Lord Robert Cecil, to which the League of Nations had given great publicity, would lead away from rather than towards stability of peace; yet the only alternative to unhampered development in chemical warfare was the exploration of all avenues towards a scheme of control universally enforced.

Coke Oven Managers' Association

Chemists and their Qualifications for Membership

IN the course of his presidential address, delivered before the Northern Section of the Coke Oven Managers' Association, at Durham, on January 27, Mr. T. Johnson said that the weakness of the Association lay in the fact that there was not at present much room for expansion, as membership was confined to managers and associate membership to assistant managers, chemists and members of the technical staff on coke ovens, by-products and allied plants, whose qualifications were satisfactory to the Council. They had now about 98 per cent. of the potential membership, and it seemed to him that they should either use the present membership as a nucleus and increase the membership by broadening the field of membership, by joining forces with the Gas Associations or the Institution of Chemical Engineers.

The principle of extending the membership was approved. After some discussion it was agreed that in the opinion of the Northern Section, manufacturers of coke ovens, manufacturers of refractory materials, tar distillers, sulphuric acid manufacturers and makers and users of internal combustion engines be eligible for associate membership of the Association. Regarding chemists it was agreed that the recognised chief chemist of a plant should be eligible as a full member providing he satisfied the Council of his qualifications for full membership. On the question of foremen it was agreed that when a foreman was recommended and approved by his manager he should be able to apply to the Council for membership as an associate, the final decision in such cases to rest with the Council.

New Methods of Crystal Analysis

Bearing on Pure and Applied Science

THE fifth Trueman Wood Lecture before the Royal Society of Arts, by Professor Sir William H. Bragg, F.R.S., and which dealt with "New Methods of Crystal Analysis, and their Bearing on Pure and Applied Science," was delivered on January 24 by Mr. Shearer (who has been associated with him in his work), owing to the unfortunate illness of Sir William. The lecture explained how a molecule may be composed of two atoms only, as in the case of oxygen and hydrogen, or of 10, 20, 30 or more atoms, as in the case of complicated organic substances. In a gas the molecules are practically independent and in a liquid, partially so, but in a crystal, which is really the simplest kind of solid, the molecules are locked together into a regular structure. By the help of X-ray analysis we have now the power of analysing this crystalline structure by methods which constitute a new field of research, chemistry having hitherto of necessity concerned itself with examinations of the more or less independent molecule. Already the work that has been done affords evidence that materials are not simple because they do not appear to be crystalline. They are often irregular masses of minute crystals or agglomerations of such crystals in a semi-liquid matrix, and their properties depend partly on those of the crystals themselves, e.g., all the construction materials, iron, and other metals, stone, wood and textiles. Examples were given in the lecture of the direct connection between the outward form and appearance and the inner construction in the case of diamonds, graphite, ice, some organic substances, quartz, tartaric acid, and so on. The lecture concluded by stating that how and when any of the results obtained with this method of investigation will have practical value cannot be foreseen. The only fairly safe prophecy was that the first things we try to do with these new powers in order to help applied science will probably be all mistakes, and that final successes which will surely come are not even to be guessed at. The instances that have been mentioned were mere pointers in the direction in which there would be a great movement in time to come, but the first aim was to develop the new methods as pure science.

Manchester Traders and Chemical Legislation

REFERENCE is made in the annual report for 1922 of the Chemical and Allied Trades Section of the Manchester Chamber of Commerce to the fact that careful attention has been given by the Executive to developments concerning the Safeguarding of Industries Act, and the Dyestuffs (Import Regulation) Act. The special Vigilance Committee formed in Manchester has been in close co-operation with that formed in London.

It is stated that at a recent meeting of the Executive the opinion was expressed that, instead of joining the London National Vigilance Committee of the Colour Users' Association, the Chamber should continue to act independently. There did not seem to be, however, any reason why the two Committees should not keep in touch with each other, and exchange information which might be of interest. This has been done, and in the representations which have been made from time to time, numerous important articles, the report states, have either been deleted from the Schedule, or have been included in the articles under the heading Prefix "R."

At a meeting held in December last the activities of the year were reviewed in detail, and careful consideration was given to the effects upon industry of both these Acts, not only from the point of view of the effect of the underlying principle upon the chemical industry, but also from the aspect of the many difficulties which had arisen in administration. No definite conclusions were reached at this meeting, and further consideration of the question has been postponed to a meeting which will be called in the near future.

Sale of a Chemist's Business

IN the Chancery Division, before Mr. Justice Eve, the hearing was resumed on January 18, and concluded on January 20, of the action brought by Charles Midgley, Ltd., manufacturers, against Taylor's Drug Co., Ltd., Leeds. It was stated that the parties had arrived at a settlement the terms of which were read. The action was dismissed, the defendants' costs in the action and counter-claim to be taxed.

Chemistry of Plant Pigments

Paper by Dr. A. E. Everest

AT a meeting of the Huddersfield Section of the Institute of Chemistry, held on January 24 at the Technical College, Huddersfield, Dr. A. E. Everest gave a lecture on "Plant Pigments." The chairman, Dr. Hodgson, in his opening remarks referred to the pioneer work in the exact science of these pigments carried out by the lecturer in collaboration with the famous German chemist Willstätter.

Dr. Everest said the industrial application of these pigments was small, and was likely to become smaller. The lecturer went on to divide the plant pigments into groups—chlorophyll, the insoluble pigments, and the sap pigments—quoting indigo and madder as isolated examples of colouring matters. As he had worked mostly with the sap pigments he gave a short account of the stages in the elucidation of the chemical constitution of these bodies.

He clearly explained the connection between the flavones, the flavonols and the anthocyanins, and described his own contributions to the chemistry of this subject. The initial difficulties of the investigation of the blue colouring matter of the cornflower were indicated. Several hundredweights of dry cornflower petals were required to give sufficient material to work upon, the petals had to be taken from flowers recently opened, and the actual extraction had to be carried out very rapidly in order to avoid decomposition. With one or two exceptions all these pigments were attached to some sugar as a glucoside.

With regard to the tinctorial value, the lecturer said that a variety of pleasing shades which were fast to light and dry-cleaning, but fugitive to hot water and alkali, could be obtained from a cold bath on tannined cotton. The lecture concluded with the exhibition of specimens of historical interest, and of dyeings from radish skins, pelargonium petals, blackberries, etc.

Institute of Chemistry Pass Lists

IT is announced that in connection with the January examinations of the Institute of Chemistry the following Associates have passed the examination for the Fellowship in branch E (The Chemistry, including Microscopy, of Food and Drugs): Hawley, John William, B.Sc. (Lond.); King, John. They were the only candidates examined in this branch. The following candidates have passed the examination for the Associateship:—

(Current Regulations in General Chemistry): Bender, Gustave William, University College, London; Cattle, Alfred Philip, East London College; Lomax, James, College of Technology, Manchester; Madden, Frank Cox, University College, London; McKean, John Brown, Paisley Technical College; Powell, Cyril John, University College, Nottingham; Reynolds, Thomas Edward Stewart, University College, London. (Regulations prior to 1920: in branch A, Mineral Chemistry): Dallimore, Thomas Warwick, Chelsea Polytechnic; Smith, William, University College, Nottingham. (Regulations prior to 1920: in branch D, Organic Chemistry): Hansford, Mitchell Harold, Blackburn Technical College; Tadman, Vernon Thorpe, University College, Nottingham; Taylor, George, University College, Nottingham. Under the first classification seven out of fifteen candidates were successful, and in the remaining two classes all the entrants passed.

Explosions in Liquid Air Plants

THE next meeting of the London Section of the Society of Chemical Industry will be held on Monday, February 5, at the Engineers' Club, 39, Coventry Street, London, at 8 p.m. Explosions in liquid air rectification plants have been attributed to acetylene in the ingoing air. Dr. E. Fyleman, in a paper on this subject, will show that acetylene is formed by the action of hot oxygen or hot compressed air on the compressor lubricating oil, and that by keeping the compressor cool explosions can be avoided. He has found that the presence of silver salt assists the absorption of acetylene by alkaline permanganate. A paper on "The Estimation of Fat in Casein," by G. T. Bray and F. Major, will also be read.

From Week to Week

MR. E. A. WEBB has retired from the board of Evans, Sons, Lescher and Webb, Ltd.

CAPTAIN OLIVER LYTTELTON has been appointed general manager of the British Metal Corporation, Ltd.

SIR THOMAS HOLLAND distributed the prizes at the Sir John Cass Technical Institute, London, on Wednesday.

NEGLIGIBLE DAMAGE was caused by fire on Tuesday at the Waterloo Oil and Cake Mills, Cleveland Street, Hull.

MR. JUSTICE SARGANT made an order on Tuesday for the restoration to the register of the Madagascar Bitumen Syndicate, Ltd.

DAMAGE estimated at £15,000 was caused by fire on Monday at the premises of the Forth Glass Works, Ltd., Panmure Street, Maryhill, Glasgow.

MR. F. H. LEES has been co-opted a member of the Council of the Institute of Chemistry in the place of Dr. F. Mollwo Perkin, who has vacated his seat.

PROFESSOR W. P. WYNNE has been nominated to fill the office of president of the Chemical Society, which will be vacated by Sir James Walker on March 22.

DR. E. K. RIDEAL has been co-opted as an additional member of the Degree Committee of the Special Board of Physics and Chemistry at Cambridge University.

MR. WILLIAM BOYD, who was for many years with the Tharsis Sulphur and Copper Co., Ltd., Glasgow, died at Woodbine Avenue, Gosforth, Newcastle-on-Tyne, on January 24.

SIR MAX MUSPRATT, who was to have accompanied a deputation to the Chancellor of the Exchequer on Tuesday, was unable to travel to London owing to a slight attack of influenza.

LORD CREWE has resigned his membership of the governing body of the Imperial College of Science of Technology, and the King has appointed Lord Buckmaster to be a member till May 31, 1925.

A DEMONSTRATION of fire extinguishing by Foamite "Firefoam," and the "Miller" chemical fire extinguisher was given last week at the Statute Labour Department Depot, Alexandra Parade, Glasgow.

DR. CHARLES CARPENTER has resigned from the Council of the Association of British Chemical Manufacturers owing to pressure of other duties, and his place has been taken by Dr. G. C. Clayton, M.P.

THE PUBLIC EXAMINATION was concluded on January 26 of Mr. W. Noble, glue manufacturer, late of 7, Baldwin's Place, London, whose statement of affairs showed unsecured liabilities of £4,846, and assets valued at £92.

APPLICATIONS for the Professorship of Physics at the University of Sydney, N.S.W., will be received by the Agent-General for New South Wales, Australia House, Strand, London, not later than February 28.

A NEW works advisory committee in connection with Lever Brothers, Ltd., Port Sunlight, has been elected on democratic lines. It is of interest to note that the method of proportional representation was adopted with success.

IN A PAPER before the Royal Society of Arts on Wednesday, Messrs. T. H. Fairbrother and A. Renshaw gave an account of their experiments on the relation between chemical constitution and antiseptic action in coal tar dyes.

THE EXPLOSION of an apparatus used for demonstrating the composition of water at Dereham High School for Girls last May, caused injuries to one of the pupils for which she was awarded £350 damages at Norwich Assizes on Monday.

A DEFICIENCY of £991 5s. 11d. was disclosed to a meeting of creditors of Parker and Lester, Ltd., paint and varnish manufacturers, held in London on Wednesday. The liquidator hoped that the business would be sold as a going concern.

THE BODY of the late Mr. James Lawrence Ward, of London, and Medford, Mass., U.S.A., managing director of the Angier Chemical Co., Ltd., 86, Clerkenwell Road, London, who died at Tunis on January 10, was interred at Hampstead Cemetery on Tuesday.

THE DEATH occurred at Streetly, Sutton Coldfield, on Tuesday, under very distressing circumstances, of Mr. John William Cotterill, F.I.C., analytical chemist and a member of the Birmingham and Midland Section of the Society of Chemical Industry.

A NEW WAGES AGREEMENT, subject to three months' notice on either side, has been prepared, as the result of which the wages and conditions of work in the whole of the dyeing industry will be dealt with by one body. There is no question at present of variation of the existing wage agreements.

IN THE KING'S BENCH DIVISION last week, Mr. Justice Greer gave judgment for Ofverberg and Co., in a dispute which arose between the company and Taylor and Co., of New York, regarding the construction of two contracts in which the latter firm bought five and ten tons respectively of sodium cyanide.

APPLICATIONS for the appointment of County Analyst under the Sale of Food and Drugs Act, 1875, and Official Agricultural Analyst under the Fertilisers and Feeding Stuffs Act, 1906, are invited by the West Sussex County Council on or before February 13. Particulars are obtainable from Mr. S. Thornely, County Hall, Chichester.

E. OFVERBERG AND CO., chemical merchants, 110, Cannon Street, London, inform us that, owing to the continued ill-health of Mr. Ofverberg, they intend temporarily to discontinue their business activities. Mr. Ofverberg, who is going to the South of France to recuperate, hopes to be able to resume business in about three months' time.

A COURSE of ten lectures on "The Micro-Organic Population of the Soil," will be given in the lecture theatre of the Botanical Department at University College, Gower Street, London, by Sir E. J. Russell and staff of the Rothamsted Experimental Station, at 5 p.m., on February 5, 7, 12, 14, 19, 21, 27, and March 1, 5, and 7. Admission to these lectures will be free.

THE ENGAGEMENT is announced between Lord Manton and Miss Alethea Langdale, second daughter of Colonel and Mrs. Philip Langdale, of Houghton Hall, Yorkshire. Lord Manton, who will be 24 in June, succeeded to the title on the death of his father, formerly Mr. Joseph Watson, the head of the soap manufacturing business of Joseph Watson and Sons, Ltd., Leeds.

CLAYTON, SON AND CO., LTD., of Leeds, have given 500 guineas, and the Tottenham District Light, Heat and Power Co. 250 guineas, towards the cost of the experimental coal gas plant for investigation of problems in the carbonisation and gasification of coal, which is being erected by Mr. Henry Woodall at Leeds University, in memory of Sir Corbett Woodall.

MR. W. WOOLLEY, head of Woolley's, Ltd., wholesale chemists, Blackburn, who had been seriously ill for several weeks, had reached such a critical stage last week that the doctors deemed a transfusion of blood a necessity. Mr. Woolley's two sons both submitted to blood transfusion. The operation was successfully performed, but Mr. Woolley died on Tuesday.

MR. C. J. GOODWIN in a letter to the *Times* points out that a technical committee is investigating the problem of commercially practicable agglomerants for patent fuel. As the result of experiments, he states, satisfactory briquettes can be made commercially either without the use of pitch, or, at any rate, with only about one quarter of the normal quantity at present employed.

MR. F. W. RICHARDSON, County Analyst for the West Riding of Yorkshire, in a lecture before the Leeds Junior Branch of the Society of Dyers and Colourists on January 25, drew attention to the many ways in which dyes could be applied to articles of food. In this connection he deprecated the substitution of skilfully camouflaged foods for the vitally necessary constituents of our everyday dietary.

AT A CONGREGATION held at Cambridge University on January 26, the recommendation of the General Board of Studies on a proposed University Lectureship in Crystallography was approved. This was to the effect that a University Lectureship in Crystallography in connection with the special Board of Physics and Chemistry be established, and that (subject to the approval of the Special Board) Mr. Arthur Hutchinson be appointed Lecturer, with a stipend of £100 provided out of the fee-fund of the Department of Mineralogy; and that the Lectureship cease with Mr. Hutchinson's tenure of it.

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HYDROCARBONS.—Study of the constituents of the fraction of Borneo spirit distilling between 37° and 81°. G. Chavanne. *Bull. Soc. Chim. Belg.*, November, 1922, pp. 331–364.

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Patent Literature

Abstracts of Complete Specifications

190,732. Acetylated Cellulose and Products Derived Therefrom, such as Artificial Silk, Horsehair Films and the Like, Process for the Manufacture of. J. O. Zdanowich, 2, Whitehall Court, London, S.W.1. Application date, June 20, 1921.

The process is for the manufacture of acetylated cellulose suitable for the manufacture of artificial silk, etc., without first precipitating it and then redissolving it. Specification No. 139,232 (see The Chemical Age, Vol. II, p. 360) describes such a process in which the cellulose is acetylated in two stages, in the first of which a weak condensing agent is produced in a nascent state in the mass, and in the second a small quantity of a strong condensing agent is used. It is now found that the condensing agent need not be used in the first stage. Cellulose is treated with a mixture of glacial acetic acid and acetic anhydride in a closed vessel fitted with a reflux condenser, for about 4 hours at 40° C., when a slight acetylation may take place. The mixture is then treated with 0·5–4 per cent. of a strong condensing agent, such as sulphuric acid mixed with glacial acetic acid, until a colourless solution is obtained. The acetic acid acts as a solvent only in the first stage, and it may be replaced by other solvents such as formic acid or ethylidene diacetyl. The sulphuric acid may be replaced by other strong condensing agents, such as phosphoric acid or chloro-sulphuric acid, not exceeding 4 per cent. of the weight of the cellulose. Other acetylating agents may be used, such as acetyl chloride, with or without glacial acetic acid, and the temperature in the first stage may be raised to 90°–100° C.

190,733. Lead Oxide, Apparatus for the Manufacture of. G. V. Barton, and The Lead Products Syndicate, Ltd., 13, Rumford Street, Liverpool. Application date, June 22, 1921.

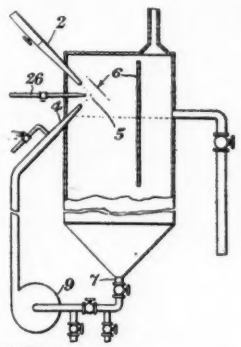
An oxide pot is heated by the furnace in the usual manner, and the upper end is connected by an inclined flue to the upper part of the condensation chamber. The pot is provided with a stirring device carried by a vertical shaft having water-cooled bearings. The condensation and collecting chamber is provided with two opposed sloping sides which converge towards a conveyor trough at the bottom. The greater part of the lead oxide is deposited, and is guided by the sloping walls of the trough into the screw conveyor at the bottom. The conveyor is arranged above the hot gas flue leading from the furnace, so that the conveyor is heated and the oxide is dried in its passage through the chamber. The effluent gases pass from the chamber through a series of conveyors having helical blades in which the lead oxide is separated and conveyed to an outlet. Reference is directed, in pursuance of Section 7, sub-section 4, of the Patents and Designs Acts, 1907 and 1919, to Specification No. 11,526* of 1909.

190,751. Light Hydrocarbons from Heavy Hydrocarbons, Process for the Production of. C. R. Burke, 816, South Cheyenne, Tulsa, Okla, U.S.A. Application date, August 22, 1921.

The apparatus is for cracking heavy oils without pressure distillation, whereby the yield of cracked products obtained under atmospheric pressure is as high as that obtained by the use of pressure stills. A still of ordinary construction is provided with a vessel of equal or greater capacity arranged immediately above it, with a constricted neck opening into the top of the still. The vapour passes into this vessel and condenses in it until it may contain about 50 per cent. or more of the original contents of the still. The condensate in the upper vessel is prevented from running back into the still by the contracted neck and by the pressure of the vapour in the still, so that this vapour passes through the condensate. The distillation is continued until the desired distillate and residue are obtained. Lighter vapour passes from the upper vessel to a condenser, and thence to a receiver, from which any uncondensed vapour is drawn by an injector and forced into a gas holder. The whole of the original oil in the still may be distilled in this manner, leaving carbon only as a residue. The connection between the collecting vessel and the still may comprise a pipe of about 3 ft. in length and 1 in. in diameter. A dark opaque oil may be treated in this apparatus until a clear reddish-coloured oil is obtained, representing about 80 per cent. of the original oil, and of slightly less density.

190,754. Hydrocarbon Oils and Tars, Process of Treating. A. B. Foster, 724, Ninth Street, N.W., Washington, D.C., U.S.A. Application date, August 23, 1921.

The apparatus is for chemically treating mineral oil products such as kerosene, gasolene, lubricating oils, crude oil or its distillates, coal tar, water-gas tar, producer-gas tar, etc. The chemical reagent, such as acid or alkali, is brought into intimate contact with the oil by projecting two streams of the liquid so as to impinge on one another, and introducing the acid, etc., into the disintegrated oil. Two streams of oil are directed from the nozzles 2, 4, so as to meet at the point 5,



190,754

and the atomised mixture is projected against a baffle plate 6 Acid or alkali is supplied through pipe 26 into the oil, and the mixture is received in the bottom of the tank. The acid sludge may contain a considerable amount of sulphuric acid, and is drawn off through a pipe 7, to the pump 9, which delivers it again to the atomizing nozzles. In a modified apparatus the acid sludge may be transferred to a duplicate apparatus, where it is projected against a stream of oil, so that a smaller quantity of acid is used. It is found that a better atomisation and mixing of the two streams of oil is obtained if the centre lines of the nozzles 2, 4 do not meet exactly, so that one jet exerts a centrifugal action on the other.

190,819. Distillation of Carbonaceous Materials, Apparatus for. T. W. S. Hutchins, Davenham, Northwich, Cheshire. Application date, October 1, 1921.

The apparatus is for the low-temperature distillation of coal, oil shale, and the like, and the object is to prevent caking within the retort and adhesion to the walls of the retort. A horizontal rotary retort is heated externally, and contains an inner concentric tube which is provided at one end with a scoop to transfer the raw material from the hopper into the tube. The tube is provided with a loose bar extending longitudinally through it, and preferably of cross-shape in cross-section. During the rotation of the tube this bar rolls over its surface and prevents any adhesion of the material. The material passes along the tube to its opposite end, and then through perforations into the outer tube, through which it travels in the opposite direction towards the inlet end of the inner tube, where the gases and solid residue are both drawn off.

190,844. Salts of 1 : 3–Dinitro–4 : 5–Dinotroso-Benzene, Process for the Manufacture of. H. Rathsburg, 25, Moststrasse, Fürth, Bavaria. Application date, October 20, 1921.

The process is for the production of the slightly soluble salts of 1 : 3-dinitro-4 : 5-dinitroso-benzene. In the known process for the production of slightly soluble salts, such as those of potassium or lead, by the use of the corresponding carbonates, the final product usually contains an excess of either the carbonate or 1:3-dinitro-4:5-dinitroso-benzene. In the present process picryl chloride is treated with sodium azide in aqueous suspension at 80°–90° C., and the resulting 1:3-dinitro-4:5-

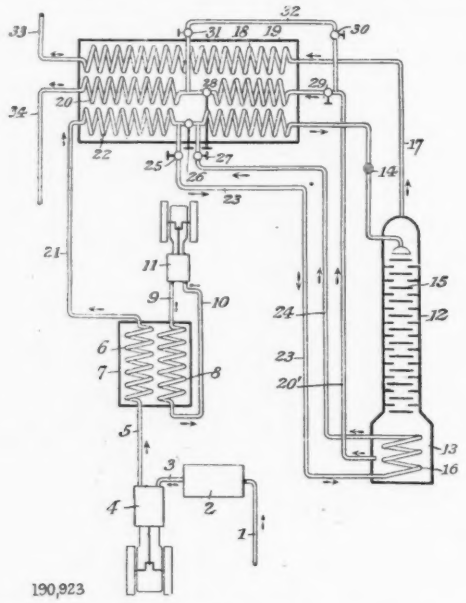
dinitroso-benzene is treated with an alkali oxide, hydroxide or carbonate, and then with an acetate, nitrate, sulphate, or chloride of the metal. The final product is thus obtained without the isolation of the picryl azide as intermediate product, and without the use of reflux condensers and organic solvents which would be necessary for this isolation.

190,891. METALDEHYDE, MANUFACTURE OF, AND ITS CONVERSION INTO FUEL. J. Y. Johnson, London. From Elektrizitätswerk Lonza, Gampel and Basle, Switzerland. Application date, December 6, 1921.

Metaldehyde may be obtained in any desired degree of stability by passing over it air containing small proportions of ammonia. Pressed blocks of metaldehyde for fuel purposes may thus be obtained, in which practically no decomposition takes place. The action of the ammonia may be controlled by regulating its dilution, the temperature and time of its action, and the rate at which it passes over the metaldehyde.

190,923. SEPARATION OF GASEOUS MIXTURES, PROCESS AND APPARATUS FOR. E. C. R. Marks, London. From The Linde Air Products Co., 30, East 42nd Street, New York. Application date, January 9, 1922.

The process is for continuously liquefying a mixture of gases. A mixture of two gases, A and B, of which A has the higher boiling point, is drawn through a pipe 1 and purifier 2 to a compressor 4, which delivers it to the coil 6 of the pre-cooler 7, where at least the heat of compression is removed by a cooling medium which is circulated through a coil 8 by means of a refrigerating machine 11. The cold compressed gas passes through a coil 22 to a rectifying column 12, into which it is expanded and partly liquefied. The liquid passes downwards



190,923

over plates 15, and collects at the base, which contains a boiling coil 16. The liquid collecting at the base 13 is mainly gas A, while gas B is substantially converted into vapour and passes out through the pipe 17. The liquefied gas A is continuously drawn off through a pipe 20 to the coil 20 of the heat exchanger, through which it passes in the same direction as the gas B in the coil 18. The compressed gas flowing through the coil 22 is cooled by the gas B and liquid A flowing in counter-current in the coils 18 and 20. The gas supplied through the boiling coil 16 is obtained from an intermediate point in the cooling coil 22, at which the temperature is still sufficiently high to boil the liquefied gas in the base 13. Valves 25, 26, 27 are provided, so that any desired fraction fo the gas may be passed through the coil without diversion to the coil 16. If it is not desirable to permit exchange of temperature between the compressed mixture after it has passed through the coil 15, and the rectified liquid in the coil 20, the latter liquid may be diverted through a by-pass pipe 32. The use of gas from an intermediate point in the coil 22 for heating the coil 16 ensures that this gas shall not be too cold for heating purposes, nor too warm for subsequent expansion through the valve 14 and liquefaction in the column 12.

190,955. LEAD OXIDE, APPARATUS FOR THE MANUFACTURE OF. G. V. Barton, and the Lead Products Syndicate, Ltd., 13, Rumford Street, Liverpool. Application date, June 22, 1921.

The oxide pot is arranged close to the depositing chamber and near the bottom. The vapour conduit passes from the top of the pot to the upper end of the depositing chamber at a steep angle but in a straight line, The angle is such that any metallic lead tending to pass over falls back by gravity. The remainder of the plant for producing the lead oxide is as described in Specification No. 190,733 (see page 125).

190,956. DEPOSITING AND CONVEYING LIGHT SUBSTANCES CARRIED IN SUSPENSION IN EFFLUENT AND OTHER GASES, APPARATUS FOR. G. V. Barton, and the Lead Products Syndicate, Ltd., 13, Rumford Street, Liverpool. Application date, June 22, 1921.

The apparatus is particularly applicable for separating lead oxide from the effluent gases from depositing chambers of lead oxide plant, such as described in Specification No. 190,733 (see above). The separating device comprises a series of superposed conveyors, each enclosed in its casing, and connected together at opposite ends alternately so as to form a continuous passage. Each casing contains a shaft carrying helical blades. The conveyors are rotated in opposite directions alternately by a common driving device, and the gas carrying the dust to be separated passes through every conveyor in a direction opposite to that of the propelling or conveying action of the blades. The gas is thus retarded in its passage, and a very efficient separation of the suspended lead oxide dust is obtained.

190,961. HYDROCYANIC ACID FROM GASES, METHOD OF RECOVERING. M. E. Mueller, 1,014, Lancaster Avenue, Syracuse, N.Y., U.S.A. Application date, April 10, 1922.

In the extraction of hydrocyanic acid from coal gas by means of copper compounds in the presence of ammonia, and the subsequent liberation of hydrocyanic acid by distilling the solution with dilute sulphuric acid, the maximum amount of cuprous sulphide is formed. Any excess of hydrogen sulphide is liberated together with the hydrocyanic acid, but if there is a deficiency of hydrogen sulphide to combine with all the copper, the excess of copper is converted into cuprous cyanide which is not decomposed by the dilute sulphuric acid. It is thus necessary for the solution to contain at least two atoms of copper for each molecule of hydrogen sulphide, in order that no hydrogen sulphide may be distilled off with the hydrocyanic acid. The absorbing medium consists of a suspension of cuprous sulphide in water, and when coal gas is passed through it, the solution soon becomes saturated with hydrogen sulphide. A continued passage of the gas results in the absorption of more hydrocyanic acid and solution of copper until the condition is reached when there are more than 2 atoms of copper in solution for each molecule of hydrogen sulphide. This solution may be distilled with dilute sulphuric acid without liberating hydrogen sulphide with the hydrocyanic acid. As a modification, the solution obtained by scrubbing the coal gas may be heated to drive off some of the hydrogen sulphide to bring the ratio of dissolved copper to hydrogen sulphide within the desired limits. In this case some hydrocyanic acid is lost with the hydrogen sulphide. The absorbing solution is usually contaminated with ammonium carbonate, which on boiling yields carbon dioxide mixed with the hydrocyanic acid. This loss of hydrocyanic acid may be avoided by adding an excess of cuprous cyanide to the solution, which reacts with the hydrogen sulphide and ammonia, yielding cuprous sulphide and ammonium cupro-cyanide. The cuprous sulphide is filtered off and returned to the scrubber, and the solution thus obtained may be boiled to expel carbon dioxide without loss of hydrocyanic acid. The distillation with sulphuric acid yields an insoluble residue of cuprous cyanide by reaction with the ammonium cupro-cyanide, and this is used again in the process as above. The process is thus a cyclic one as regards the copper compounds. If the absorption of hydrocyanic acid is carried beyond the stage at which there are two atoms of dissolved copper for each molecule of hydrogen sulphide,

the quantity of copper is still sufficient for the cycle of operations, but the quantity of cuprous cyanide produced will be more than is required and the excess may be returned to the scrubber with the cuprous sulphide.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: —171,693 (Gerb-und Farbstoffwerke H. Renner and Co., Akt.-Ges.) relating to a process and re-agents for tanning, see Vol. VI, p. 79; 173,780 (Elektrizitätswerk Lonza) relating to a process for improving electrolytic mercuric oxide, see Vol. VI, p. 322; 180,326 (M. Blasi) relating to the electrolytic production of aluminium, see Vol. VII, p. 91.

International Specifications not yet Accepted

189,148. DECOLORISING CARBON. Algemeene Norit Maatschappij, 2, Den Texstraat, Amsterdam. International Convention date, November 19, 1921.

Wood waste, peat, waste cellulose, lignite, briquetted coal or other carbonaceous material is dry-distilled in a retort through which activating gases are passed in the reverse direction. These gases may be chlorine. volatile chlorides, air, steam, carbon dioxide or monoxide, flue or generator gases, and the gases are introduced at a temperature of 100°–600° C. The distillation gases may be drawn off and used for heating the retort. Other activating substances, such as calcium or magnesium carbonate or chloride, slaked or unslaked lime, may also be present in the retort. The decolorising carbon produced is ground and purified by treating with hydrochloric acid.

189,416. CELLULOSE ESTER SOLUTIONS. Nitrogen Corporation, 55, Canal Street, Providence, R.I., U.S.A. (Assignees of J. C. Clancy, Providence, R.I., U.S.A.) International Convention date, November 21, 1921.

Cellulose acetates and nitrates, and mixtures of these, are dissolved in liquid sulphur dioxide, which is free from moisture and other impurities, for the manufacture of artificial silk films, etc. The solution is effected under pressure and the removal of the solvent at a raised temperature and reduced pressure. The solution may be mixed with partial solvents of cellulose esters, such as aliphatic alcohol, carbon tetrachloride, pentachlorethane, dichlorethane, amyl acetate, gasolene, benzene, turpentine and chlorinated oils, and the ester remains in solution in these solvents when the sulphur dioxide is evaporated.

189,419. FERTILISERS. J. Gradl, Munich, Germany. International Convention date, November 22, 1921. Addition to 184,800. (See THE CHEMICAL AGE, Vol. VII, p. 800.)

The process is for making fertilisers from coal or lignite by mixing with catalysts or oxidising agents. The coal or lignite is subjected to a preliminary treatment by heating to a temperature below sintering, or by treating with sulphuric or acetic acid, alkali, or superheated steam. The catalyst may be a copper salt with or without an ammonium salt. Fertilisers may be made from (1) steamed coal, manganese dioxide and acetic acid; (2) steamed lignite, acetic acid and copper acetate; (3) powdered peat, ammonium nitrate, raw phosphate and acetic acid; (4) "humus-lignite," copper sulphate, ammonium nitrate and ammonia.

189,432. FORMALDEHYDE. Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-am-Main, Germany. International Convention date, November 25, 1921.

Methylene chloride vapour and steam are passed over clay, infusorial earth, charcoal, or activated charcoal, yielding a condensate of formaldehyde dissolved in hydrochloric acid.

189,450. MENTHOL, ISOMENTHOL AND MENTHONE. Rheinische Kampfer-Fabrik Ges., 20, Kasselerstrasse, Oberkassel, Düsseldorf, Germany. International Convention date, November 23, 1921.

Thymol is heated in an autoclave with hydrogen in the presence of a catalyst of nickel, cobalt, platinum or palladium, yielding a mixture of menthol and isomenthol. The menthol separates on cooling, and is removed by a centrifuge. The liquid isomenthol is dehydrogenised into menthone by heating with copper oxide or nickel oxide, preferably in the presence of an alkali. The menthone may then be mixed with more thymol and hydrogenated under pressure as before to yield menthol and isomenthol.

189,787. UREA. Soc. des Produits Azotés, 2, Rue Blanche, Paris. International Convention date, November 29, 1921.

An acid solution of urea is cooled to −10°— −15° C. to eliminate part of the water as ice, and further concentration is effected by evaporation *in vacuo*. The concentration is such that only urea is deposited on cooling to 0° C., the whole of the acid remaining in solution.

LATEST NOTIFICATIONS.

192,032. Manufacture of sodium nitrate. Guggenheim Bros. January 19, 1922.

192,033. Method of and apparatus for burning sulphur. Texas Gulf Sulphur Co., Inc. January 21, 1922.

192,037. Explosive using liquid oxygen. Wendel et Cie, Les Petits Fils de F. de. January 21, 1922.

192,040. Processes and plant for the low temperature carbonisation of solid fuels, carbonaceous material, and the like. White, W.C. January 18, 1922.

192,047. Steam-generating installations. Babcock and Wilcox, Ltd. January 23, 1922.

Specifications Accepted, with Date of Application

171,367. Hydrocarbons of relatively low boiling point from tar oils, Process of producing. M. Melamid. November 11, 1920.

176,785. Magnesium carbonate from dolomite, Manufacture of. T. Simon. March 7, 1921.

185,757. Ethylene and its homologues, Process of absorbing. Farbenfabriken vorm. F. Bayer and Co. December 9, 1921.

187,231. Chrome alum. Chemische Fabrik in Billwarder vorm. Hell and Sthamer Akt.-Ges. and P. Hasenclever. October 12, 1921.

190,995. Sulphur protochloride, Process for the manufacture of. E. Legeler. December 29, 1921.

191,412. Refractory bricks and the like from dolomite, Manufacture of. C. A. Longbottom, F. L. Duffield and W. J. Rees. July 4, 1921.

191,415. Carbonaceous and similar materials, Treatment of—for the utilisation of the nitrogen therein. E. L. Pease. July 12, 1921.

191,417. Resinous products of condensation from phenol and formaldehyde, Process for the manufacture of. C. Kulas and C. Pauling. August 8, 1921.

191,472. Emulsions, Production of. W. Douglas and Sons, Ltd., and J. S. Nicol. October 12, 1921.

191,487. Latex, Apparatus for the treatment of. Sir H. A. Wickham and Roa, Ltd. October 14, 1921.

191,553. Cellulose acetate products, Dyeing of. R. Clavel. November 19, 1921.

191,582. Aluminium chloride, Recovery of. R. Haddan. (*Gulf Refining Co.*). December 12, 1921.

191,630. Phosphoric acid, Production of. H. G. C. Fairweather. (*Federal Phosphorus Co.*) February 1, 1922.

191,687. Waste liquors, Treating—and obtaining valuable products therefrom. Silver Springs Bleaching and Dyeing Co., Ltd., and A. J. Hall. July 21, 1922.

191,692. Phosphoric acid and ferro phosphorus, Production of. H. G. C. Fairweather. (*Federal Phosphorus Co.*) February 1, 1922.

Applications for Patents

Anglo-Saxon Petroleum Co., Ltd., and Hillman, E. S. Purifying mineral oils from sulphur. 2543. January 27.

Barbet et Fils et Cie, E. Production of absolute alcohol. 2461. January 26. (France, January 26, 1922.)

Bhopal Produce Trust, Ltd. Obtaining calcium oxalate from vegetable matter. 2052. January 23. (British India, December 21, 1922.)

Bonn, C. R. H. Apparatus for indicating pressure, velocity, and/or volume of fluids. 2532. January 27.

British Cellulose and Chemical Manufacturing Co., Ltd., Dickie, W. A., and Small, F. T. Manufacture of plastic materials. 1978. January 22.

British Cellulose and Chemical Manufacturing Co., Ltd., and Ellis, G. H. Treatment of cellulose acetate, etc. 2554, 2555, 2556. January 27.

Coke and Gas Ovens, Ltd., and Still, C. Apparatus for production of neutral ammonia sulphate. 2077. January 23.

Elektrizitätswerk Lonza. Manufacture of acetone from acetylene. 2200. January 24. (Germany, January 26, 1922.)

Fathers, G. H. Manufacture of fuel briquettes. 2444. January 26.

Harper, W. A., and Williams, W. M. Manufacture of decolorising-carbon. 2161. January 24.

Lund, W. Production of alkali salts of higher fatty acids. 1980. January 22.

Stalli, A. Apparatus to distil petroleum, etc., from oil shales, coal, etc. 1974. January 22.

Tapping, F. F., and Thornley, F. C. Method of obtaining stable aqueous emulsions of pitch, etc. 2440. January 26.

Zalocostas, D. G. Apparatus for treating liquids with gases. 2212. January 24. (Australia, January 25, 1922.)

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, *and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.*

London, February 1, 1923.

WE are pleased to be able to report a brisk market during the past week, and a substantial volume of business has gone through.

Almost without exception prices are firm and indications are in the direction of higher prices.

There is considerable uncertainty as to the effect which the Continental situation will have upon the markets, it being thought in many directions that there will be a shortage of Continental supplies which might bring about a very much higher standard of values.

The export situation is without special feature.

General Chemicals

ACETONE is very scarce indeed in all positions. There are practically no stocks and the price is particularly firm.

ACID ACETIC is decidedly firmer in price. Second-hand supplies have been absorbed, and an active business is reported.

ACID CITRIC is inclined to be firmer and higher prices are expected as the season approaches.

ACID FORMIC.—There has been a better demand, but prices are very cut, owing to realisation of dealers' commitments.

ACID LACTIC.—Unchanged.

ACID OXALIC is in fairly good demand, and the price is firm.

ACID TARTARIC is firmer in price, and the demand has been slightly better.

ARSENIC.—Unchanged.

BARIUM CHLORIDE is fairly active at recent figures.

CREAM TARTAR is very low in price, and a little more interest is being taken in the article.

FORMALDEHYDE is a very firm market, and prices are expected to go higher.

LEAD ACETATE is firmer and in fairly good demand.

METHYL ALCOHOL is practically unobtainable, and price is nominal.

POTASSIUM CARBONATE is without special feature.

POTASSIUM CAUSTIC is a weak market, nominally unchanged.

POTASSIUM PERMANGANATE is decidedly firmer. Stocks are very limited.

POTASSIUM PRUSSIATE is very scarce and firm in tone.

SODA ACETATE.—Unchanged.

SODIUM NITRITE has been in rather better demand, but lower prices are in evidence.

SODIUM PRUSSIATE is in fair demand, and the price is maintained.

ZINC OXIDE.—Unchanged.

Pharmaceutical Chemicals

ACETYL SALICYLIC ACID is firm at last prices.

AMIDOPYRIN is neglected and in buyers' favour.

BROMIDES.—The market has been unsettled. A meeting of the leading German bromide and bromine manufacturers apparently led to no definite result.

HEXAMINE has again been in active demand. Spot supplies are scarce and higher prices are foreshadowed.

HYDROQUINONE is easier for both spot and forward delivery.

PARALDEHYDE.—The firm position is maintained; higher prices being asked for forward.

PHENACETIN is advancing.

PHENAZONE is the turn easier.

RESORCINE is slightly lower on the week.

METHYL SALICYLATE is much firmer in sympathy with METHYL. Manufacturers have advanced their price.

SODA SALICYLATE is active and unchanged. The raw materials are advancing and consumers may consider it advisable to fully cover.

VANILLIN is steadier in sympathy with Clove Oil.

Coal Tar Intermediates

Business in this market during the last week has been rather better with more inquiry about and a certain number of orders placed.

ALPHA NAPHTHOL has been inquired for, both on home and export account, and stocks continue rather short.

ALPHA NAPHTHYLAMINE has been in demand following recent reductions, and a fair business has been done.

ANILINE OIL is slightly lower in price and some home contracts have been concluded.

ANILINE SALT.—Some small export inquiry.

BENZIDINE BASE.—Home consumers are in the market and stocks of first-grade material at reasonable prices seem rather short.

BETA NAPHTHOL is the turn easier and only a small business is passing.

BETA NAPHTHYLAMINE.—More trade has been done and resale stocks seem short.

DIMETHYLANILINE.—A certain small inquiry is about.

"H" ACID.—Some orders have been placed.

NITRO BENZOL is a steady home trade.

ORTHO TOLUIDINE.—A fair export inquiry.

PARAPHENYLENEDIAMINE is firm, with a steady business passing.

"R" SALT has been the object of fair interest.

XYLIDINE is without special feature.

Coal Tar Products

The market in coal tar products maintains a fairly firm tone and there is little change in prices from last week.

90's BENZOL is plentiful, and is worth 1s. 6d. to 1s. 7d. per gallon on rails in the North, and about 1s. 10d. to 1s. 11d. per gallon in London.

PURE BENZOL is easy at 2s. per gallon in the North and 2s. 4d to 2s. 6d. in London.

CREOSOTE OIL is scarce and the demand keeps good. It is worth about 8d. per gallon on rails in the North and from 8¼d. to 8½d. in the South.

CRESYLIC ACID has a poor inquiry and is worth about 1s. 9d. per gallon for the dark quality, 95-97 per cent., while the pale quality, 97-99 per cent., is quoted at 1s. 11d. to 2s. per gallon.

SOLVENT NAPHTHA has very little demand and is worth about 1s. 6d. per gallon on rails in the North, while in London the price is about 1s. 11d. to 2s. per gallon.

HEAVY NAPHTHA is uninteresting and is worth about 1s. 6d. per gallon on rails.

NAPHTHALENE has a good inquiry and the crude and whizzed qualities with lower melting points are worth about £7 to £8 per ton, while hot pressed with a fairly high melting point is worth about £10 per ton.

PITCH.—The market remains very firm and sellers are scarce, except at very full prices. To-day's values may be taken as 150s. f.o.b. East Coast, 152s. 6d. to 155s. f.o.b. London, and 147s. 6d. to 150s. f.o.b. West Coast.

Sulphate of Ammonia

There is no change in the prices and the demand for export is not very active.

Current Prices

General Chemicals

	Per	£	s.	d.		£	s.	d.
Acetic anhydride	lb.	0	1	4	to	0	1	6
Acetone oil	ton	90	0	0	to	95	0	0
Acetone, pure	ton	130	0	0	to	135	0	0
Acid, Acetic, glacial, 99-100%	ton	67	0	0	to	68	0	0
Acetic, 80% pure	ton	45	0	0	to	46	0	0
Arsenic, liquid, 2000 s.g.	ton	100	0	0	to	105	0	0

	Per	£	s.	d.		£	s.	d.
Acid, Boric, cryst.	ton	55	0	0	to	60	0	0
Carbolic, cryst. 39–40%	lb.	0	0	8¾	to	0	0	9
Citric	lb.	0	1	9	to	0	1	10
Formic, 80%	ton	50	0	0	to	51	0	0
Hydrofluoric	lb.	0	0	7½	to	0	0	8½
Lactic, 50 vol.	ton	41	0	0	to	43	0	0
Lactic, 60 vol.	ton	43	0	0	to	44	0	0
Nitric, 80 Tw.	ton	27	0	0	to	29	0	0
Oxalic	lb.	0	0	7	to	0	0	7½
Phosphoric, 1.5	ton	40	0	0	to	42	0	0
Pyrogallic, cryst.	lb.	0	5	9	to	0	6	0
Salicylic, Technical	lb.	0	1	2	to	0	1	4
Sulphuric, 92–93%	ton	6	10	0	to	7	10	0
Tannic, commercial	lb.	0	2	3	to	0	2	9
Tartaric	lb.	0	1	2½	to	0	1	3
Alum, lump	ton	11	10	0	to	11	15	0
Alum, chrome	ton	28	0	0	to	29	0	0
Alumino ferric	ton	9	0	0	to	9	5	0
Aluminium, sulphate, 14–15%	ton	7	10	0	to	8	0	0
Aluminium, sulphate, 17–18%	ton	9	10	0	to	10	0	0
Ammonia, anhydrous	lb.	0	1	6	to	0	1	8
Ammonia, .880	ton	32	0	0	to	34	0	0
Ammonia, .920	ton	22	0	0	to	24	0	0
Ammonia, carbonate	lb.	0	0	4	to	0	0	4½
Ammonia, chloride	ton	50	0	0	to	55	0	0
Ammonia, muriate (galvanisers)	ton	35	0	0	to	37	10	0
Ammonia, nitrate (pure)	ton	35	0	0	to	40	0	0
Ammonia, phosphate	ton	65	0	0	to	68	0	0
Ammonia, sulphocyanide, com'l, 90%	lb.	0	1	1	to	0	1	3
Amyl acetate	ton	175	0	0	to	185	0	0
Arsenic, white, powdered	ton	70	0	0	to	75	0	0
Barium, carbonate, Witherite	ton	5	0	0	to	6	0	0
Barium carbonate, Precip.	ton	15	0	0	to	16	0	0
Barium, Chlorate	ton	65	0	0	to	70	0	0
Barium Chloride	ton	15	0	0	to	15	15	0
Nitrate	ton	33	0	0	to	35	0	0
Sulphate, blanc fixe, dry	ton	20	10	0	to	21	0	0
Sulphate, blanc fixe, pulp	ton	10	5	0	to	10	10	0
Sulphocyanide, 95%	lb.	0	1	0	to	0	1	1
Bleaching powder, 35–37%	ton	10	10	0	to	11	0	0
Borax crystals	ton	28	0	0	to	32	0	0
Calcium acetate, Brown	ton	12	10	0	to	13	10	0
,, ,, Grey	ton	17	10	0	to	18	0	0
Calcium Carbide	ton	16	0	0	to	17	0	0
Chloride	ton	6	0	0	to	7	0	0
Carbon bisulphide	ton	35	0	0	to	40	0	0
Casein technical	ton	98	0	0	to	105	0	0
Cerium oxalate	lb.	0	3	0	to	0	3	6
Chromium acetate	lb.	0	1	1	to	0	1	3
Cobalt acetate	lb.	0	6	0	to	0	6	6
Oxide, black	lb.	0	9	6	to	0	10	0
Copper chloride	lb.	0	1	2	to	0	1	3
Sulphate	ton	27	10	0	to	28	10	0
Cream Tartar, 98–100%	ton	92	10	0	to	95	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde, 40% vol.	ton	90	0	0	to	95	0	0
Formusol (Rongalite)	lb.	0	2	2	to	0	2	3
Glauber salts, commercial	ton	5	0	0	to	5	10	0
Glycerin, crude	ton	65	0	0	to	67	10	0
Hydrogen peroxide, 12 vols.	gal.	0	2	3	to	0	2	4
Iron perchloride	ton	30	0	0	to	32	0	0
Iron sulphate (Copperas)	ton	3	10	0	to	4	0	0
Lead acetate, white	ton	41	0	0	to	43	0	0
Carbonate (White Lead)	ton	45	0	0	to	48	0	0
Nitrate	ton	44	10	0	to	45	0	0
Litharge	ton	35	10	0	to	36	0	0
Lithopone, 30%	ton	22	10	0	to	23	10	0
Magnesium chloride	ton	5	10	0	to	6	0	0
Carbonate, light	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	6	10	0	to	7	0	0
Sulphate (Druggists')	ton	10	0	0	to	11	0	0
Manganese Borate, commercial	ton	65	0	0	to	75	0	0
Sulphate	ton	58	0	0	to	60	0	0
Methyl acetone	ton	70	0	0	to	75	0	0
Alcohol, 1% acetone	ton	105	0	0	to	110	0	0
Nickel sulphate, single salt	ton	45	0	0	to	46	0	0
Ammonium sulphate, double salt	ton	45	0	0	to	46	0	0
Potash, Caustic	ton	32	0	0	to	33	0	0
Potassium bichromate	lb.	0	0	6	to	0	0	6½
Carbonate, 90%	ton	30	0	0	to	31	0	0
Chloride, 80%	ton	9	10	0	to	10	10	0
Chlorate	lb.	0	0	4¼	to	0	0	4½
Metabisulphite, 50–52%	ton	84	0	0	to	90	0	0
Nitrate, refined	ton	43	0	0	to	45	0	0
Permanganate	lb.	0	0	9	to	0	0	9¼
Prussiate, red	lb.	0	4	3	to	0	4	6
Prussiate, yellow	lb	0	1	6½	to	0	1	7½
Sulphate, 90%	ton	12	10	0	to	13	10	0

	Per	£	s.	d.		£	s.	d.
Salammoniac, firsts	cwt.	3	3	0	to		—	
Seconds	cwt.	3	0	0	to		—	
Sodium acetate	ton	24	10	0	to	24	15	0
Arseniate, 45%	ton	40	0	0	to	42	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	4½	to	0	0	4¾
Bisulphite 60–62%	ton	21	0	0	to	23	0	0
Chlorate	lb.	0	0	3½	to	0	0	3¾
Caustic, 70%	ton	19	10	0	to	20	0	0
Caustic, 76%	ton	20	10	0	to	21	0	0
Hydrosulphite, powder	lb.	0	1	6	to	0	1	7
Hyposulphite, commercial	ton	10	10	0	to	11	0	0
Nitrite, 96–98%	ton	28	0	0	to	29	0	0
Phosphate, crystal	ton	16	0	0	to	16	10	0
Perborate	lb.	0	0	10	to	0	0	10½
Prussiate	lb.	0	0	10½	to	0	0	11
Sulphide, crystals	ton	10	10	0	to	11	0	0
Sulphide, solid, 60–62%	ton	16	10	0	to	17	10	0
Sulphite, cryst.	ton	12	10	0	to	13	0	0
Strontium carbonate	ton	55	0	0	to	60	0	0
Strontium Nitrate	ton	40	0	0	to	42	0	0
Strontium Sulphate, white	ton	6	10	0	to	7	10	0
Sulphur chloride	ton	25	0	0	to	27	10	0
Sulphur, Flowers	ton	11	10	0	to	12	10	0
Roll	ton	11	0	0	to	12	0	0
Tartar emetic	lb.	0	1	3	to	0	1	4
Tin perchloride, 33%	lb.	0	1	2	to	0	1	4
Perchloride, solid	lb.	0	1	5	to	0	1	7
Protochloride (tin crystals)	lb.	0	1	4	to	0	1	5
Zinc chloride 102° Tw.	ton	21	0	0	to	22	10	0
Chloride, solid, 96–98%	ton	25	0	0	to	30	0	0
Oxide, 99%	ton	40	0	0	to	42	0	0
Dust, 90%	ton	45	0	0	to	47	10	0
Sulphate	ton	16	10	0	to	17	10	0

Pharmaceutical Chemicals

Acetyl salicylic acid	lb.	0	2	10	to	0	3	0
Acetanilid	lb.	0	1	4	to	0	1	6
Acid, Gallic, pure	lb.	0	3	0	to	0	3	3
Lactic, 1.21	lb.	0	2	9	to	0	3	0
Salicylic, B.P.	lb.	0	1	5	to	0	1	7
Tannic, leviss	lb.	0	3	4	to	0	3	6
Amidol	lb.	0	8	6	to	0	8	9
Amidopyrin	lb.	0	14	0	to	0	14	6
Ammon ichthosulphonate	lb.	0	2	0	to	0	2	3
Barbitone	lb.	0	12	6	to	0	13	6
Beta naphthol resublimed	lb.	0	1	9	to	0	2	0
Bromide of ammonia	lb.	0	0	7½	to	0	0	8
Potash	lb.	0	0	6½	to	0	0	7
Soda	lb.	0	0	7	to	0	0	7½
Caffeine, pure	lb.	0	12	0	to	0	12	3
Calcium glycerophosphate	lb.	0	5	6	to	0	6	0
Calcium lactate	lb.	0	2	0	to	0	2	3
Calomel	lb.	0	4	9	to	0	5	0
Chloral hydrate	lb.	0	4	3	to	0	4	6
Cocaine alkaloid	oz.	0	18	6	to	0	19	0
Cocain hydrochloride	oz.	0	15	0	to	0	15	6
Corrosive sublimate	lb.	0	4	3	to	0	4	6
Eucalyptus oil, B.P. (70–75% eucalyptol)	lb.	0	1	7	to	0	1	7½
B.P. (75–80% eucalyptol)	lb.	0	1	8	to	0	1	8½
Guaiacol carbonate	lb.	0	8	0	to	0	8	3
Liquid	lb.	0	9	0	to	0	9	6
Pure crystals	lb.	0	10	0	to	0	10	6
Hexamine	lb.	0	3	9	to	0	4	0
Hydroquinone	lb.	0	3	0	to	0	3	3
Lanoline anhydrous	lb.	0	0	7½	to	0	0	8
Lecithin ex ovo	lb.	0	18	6	to	1	0	0
Lithia carbonate	lb.	0	9	6	to	0	10	0
Methyl salicylate	lb.	0	2	2	to	0	2	6
Metol	b.	0	10	0	to	0	10	6
Milk sugar	cwt.	4	17	6	to	5	2	6
Paraldehyde	lb.	0	1	5	to	0	1	6
Phenacetin	lb.	0	5	0	to	0	5	3
Phenazone	lb.	0	6	6	to	0	6	9
Phenolphthalein	lb.	0	5	0	to	0	5	3
Potassium sulpho guaiacolate	lb.	0	5	0	to	0	5	3
Quinine sulphate, B.P.	oz.	0	2	3			—	
Resorcine, medicinal	lb.	0	5	3	to	0	5	6
Salicylate of soda powder	lb.	0	2	0	to	0	2	3
Crystals	lb.	0	2	1	to	0	2	4
Salol	lb.	0	2	3	to	0	2	6
Soda Benzoate	lb.	0	2	0	to	0	2	3
Sulphonal	lb.	0	13	6	to	0	14	0
Terpene hydrate	lb.	0	1	9	to	0	2	0
Theobromine, pure	lb.	0	12	0	to	0	12	6
,, soda salicylate	lb.	0	8	6	to	0	9	0
Vanillin	lb.	1	2	0	to	1	3	0

Coal Tar Intermediates, &c.

	Per	£	s.	d.		£	s.	d.
Alphanaphthol, crude	lb.	0	2	0	to	0	2	3
Alphanaphthol, refined	lb.	0	2	6	to	0	2	9
Alphanaphthylamine	lb.	0	1	6	to	0	1	7
Aniline oil, drums extra	lb.	0	0	9½	to	0	0	10
Aniline salts	lb.	0	0	9½	to	0	0	10
Anthracene, 40–50%	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine)	lb.	0	3	0	to	0	3	3
Benzidine, base	lb.	0	5	0	to	0	5	3
Benzidine, sulphate	lb.	0	3	9	to	0	4	0
Benzoic acid	lb.	0	2	0	to	0	2	3
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol	lb.	0	1	2½	to	0	1	3
Betanaphthylamine, technical	lb.	0	4	0	to	0	4	3
Croceine Acid, 100% basis	lb.	0	3	3	to	0	3	6
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	4	6	to	0	4	9
Dinitrobenzol	lb.	0	1	1	to	0	1	2
Dinitrochlorbenzol	lb.	0	0	11	to	0	1	0
Dinitronaphthalene	lb.	0	1	4	to	0	1	5
Dinitrotoluol	lb.	0	1	4	to	0	1	5
Dinitrophenol	lb.	0	1	7	to	0	1	9
Dimethylaniline	lb.	0	2	6	to	0	2	9
Diphenylamine	lb.	0	3	9	to	0	4	0
H-Acid	lb.	0	5	0	to	0	5	3
Metaphenylenediamine	lb.	0	4	0	to	0	4	3
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	5	9	to	0	6	0
Metatoluylenediamine	lb.	0	4	0	to	0	4	3
Monosulphonic Acid (2.7)	lb.	0	5	6	to	0	6	0
Naphthionic acid, crude	lb.	0	2	3	to	0	2	6
Naphthionate of Soda	lb.	0	2	6	to	0	2	9
Naphthylamin-di-sulphonic-acid	lb.	0	4	0	to	0	4	3
Neville Winther Acid	lb.	0	7	9	to	0	8	0
Nitrobenzol	lb.	0	0	8	to	0	0	8½
Nitronaphthalene	lb.	0	1	0	to	0	1	1
Nitrotoluol	lb.	0	0	8	to	0	0	9
Orthoamidophenol, base	lb.	0	12	0	to	0	12	6
Orthodichlorbenzol	lb.	0	1	0	to	0	1	1
Orthotoluidine	lb.	0	0	10	to	0	0	11
Orthonitrotoluol	lb.	0	0	3	to	0	0	4
Para-amidophenol, base	lb.	0	8	6	to	0	9	0
Para-amidophenol, hydrochlor	lb.	0	7	6	to	0	8	0
Paradichlorbenzol	lb.	0	0	6	to	0	0	7
Paranitraniline	lb.	0	3	0	to	0	3	3
Paranitrophenol	lb.	0	2	3	to	0	2	6
Paranitrotoluol	lb.	0	2	9	to	0	3	0
Paraphenylenediamine, distilled	lb.	0	11	6	to	0	11	9
Paratoluidine	lb.	0	5	9	to	0	6	3
Phthalic anhydride	lb.	0	2	6	to	0	2	9
Resorcin, technical	lb.	0	4	0	to	0	4	3
Sulphanilic acid, crude	lb.	0	0	10	to	0	0	11
Tolidine, base	lb.	0	7	3	to	0	7	9
Tolidine, mixture	lb.	0	2	6	to	0	2	9

Essential Oils and Synthetics

Essential Oils.	£	s.	d.
Anise ..... c.i.f. 1/10½, spot dull	0	2	1
Bay	0	11	0
Bergamot ..... firmer	0	11	6
Cajuput	0	3	9
Camphor brown ..... per cwt.	3	18	0
Camphor white ..... per cwt.	4	2	6
Cassia ..... c.i.f. 7/-, spot	0	8	3
Cedarwood	0	1	6
Citronella (Ceylon) ..... very firm	0	2	11
Citronella (Java) ..... very firm	0	3	5
Clove ..... easier	0	7	0
Eucalyptus ..... dull	0	1	6
Geranium Bourbon	1	4	0
Lavender ..... dull	1	12	6
Lavender spike	0	3	3
Lemon ..... firmer	0	2	11½
Lemongrass ..... quiet	0	0	2½
Lime (distilled) ..... strong	0	3	0
Mint (dementholised Japanese)	0	7	3
Orange Sweet (Sicilian)	0	9	0
Orange Sweet (West Indian) ..... quiet	0	8	6
Otto of Rose ..... per oz., dull	1	4	0
Palmarosa ..... firm	0	17	6
Patchouli ..... dull	1	12	0
Peppermint (American)	0	13	6
Rosemary	0	1	8
Sandalwood ..... firm	1	6	0
Sassafras	0	5	0
Thyme ..... according to quality	2/4	to	6/6

Synthetics.	£	s.	d.
Benzyl acetate	0	3	0
Benzyl benzoate	0	3	0
Citral	0	10	6
Coumarine	0	12	0
Heliotropine	0	5	6
Ionone	1	7	0
Linalyl acetate	1	2	6
Methyl salicylate	0	2	0
Musk xylol	0	8	6
Terpeniol	0	2	10½

The Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, February 1, 1923.

The past week has witnessed a slight slackening off in the amount of business put through on the Manchester chemical market. This, however, is regarded by traders more in the light of a temporary halt rather than as the beginning of one of those depressing periods that have characterised the chemical trade for some time. For a number of the bread-and-butter lines business is still brisk, both on home and foreign account. Prices are firm all round, with a rising tendency in several sections where spot lots are not easy to get hold of.

Heavy Chemicals

Caustic soda is very firm at £19 per ton for 60–68 per cent. strength, and £21 10s. for 76–77 per cent., the home and foreign demand for this material being maintained. Bleaching powder is also being readily taken up both by home users and for shipment at £11 10s. per ton. Soda crystals are still quiet but firm at £5 10s. per ton delivered. Salt-cake is also on the quiet side, though the price is steady at £4 10s. per ton. Little business is being done in Glauber salts, but the price is maintained at £4 10s. per ton. Sodium sulphide, 60–65 per cent concentrated, is unchanged at £16 per ton, and crystals at £10, the demand still being restricted. Bicarbonate of soda keeps steady at £10 10s. per ton, a fairly good inquiry being met with. Alkali is in moderate home and export demand at £7 12s. 6d. per ton for 58 per cent. material. Hypo-sulphite of soda is inactive at £16 per ton for photographic crystals, and about £10 for commercial. Nitrite of soda is rather scarce, and meets with a steady demand with price firm at £28 per ton. Phosphate of soda has improved somewhat, and is a shade firmer at £16 per ton. Chlorate of soda is steady at 3d. per lb., with buyers taking fair quantities. Prussiate of soda is on the quiet side at 9¾d. per lb. A steady demand is being experienced for bichromate of soda at 4½d. per lb. Acetate of soda has been selling rather better, and quotations are firmer at £23 15s. per ton.

Caustic potash keeps steady at £28 10s. per ton for 88–90 per cent. strength, with, however, only a quiet sale. Carbonate of potash is firm at £31 10s. per ton for 96–98 per cent. material, and £24 for 90 per cent. Bichromate of potash is in slightly improved demand at 6d. per lb. Yellow prussiate of potash is still quiet but firm at 1s. 6d. per lb., with red quoted at 4s.

Sulphate of copper continues to meet with a rather active inquiry for export at £26 10s. per ton, but home buying is on a small scale. Arsenic is exceedingly firm at £75 per ton for spot lots of white powdered, Cornish makes, supplies still being short for prompt shipment. Commercial Epsom salts are unchanged at £5 10s. per ton, with magnesium sulphate, B.P., steady at £8 to £8 10s. Grey acetate of lime is scarce, and quotations are now about £18 10s. per ton, with brown unchanged at £8 10s.

Acids and Tar Products

The improvement in tartaric and citric acids is fully maintained, the former being on offer at 1s. 2½d., and citric B.P. crystals, at 1s. 8½d. per lb. Acetic acid is firm and in steady demand at £68 for glacial and £43 per ton for 80 per cent. technical. Oxalic acid is quiet but unchanged at 8¾d. per lb.

Pitch prices are firmer at £7 per ton f.o.b. Manchester on a continued good demand for shipment. Carbolic acids are steady at 8¾d. to 9d. per lb. for crystals, and 2s. 6d. per gal. for crude, 60 per cent. material, supplies being readily taken up. Benzol has firmed up again, and is now quoted at 1s. 9d. per gal. Solvent naphtha is still quiet, also at 1s. 9d. per gal. A very active demand for creosote oil has brought prices up to about 8½d. per gal. Naphthalenes are in better inquiry at about £16 10s. for refined, and up to £10 per ton for crude.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, January 31, 1923.

BUSINESS during the past week has been quiet, and there is nothing of importance to record.

Continental offers continue to be numerous, and prices quoted are already inclined to be higher.

Industrial Chemicals

ACID ACETIC.—Glacial 98/100%, £60 to £64 per ton; 80% pure, £44 to £46 per ton; 80% technical £42 to £44 per ton, ex wharf.

ACID BORACIC.—Price remains unchanged; crystal or granulated £55 per ton; powdered £57 per ton, delivered U.K. stations.

ACID CARBOLIC (ICE CRYSTALS).—Price advanced to about 9d. per lb. f.o.b. U.K.

ACID FORMIC, 80%.—Now about £56 to £58 per ton, ex wharf.

ACID HYDROCHLORIC.—Makers' price unchanged 6s. 6d. per carboy, ex works.

ACID OXALIC.—Offered at 6½d. per lb. ex wharf.

ACID SULPHURIC.—144°, £4 per ton; 168°, £7 5s. per ton, ex works. De-arsenicated quality, £1 per ton more.

ACID TARTARIC.—Quoted 1s. 2d. per lb. ex store.

ALUM, LUMP POTASH.—Offered from Continent at £10 15s. per ton, c.i.f. U.K.

ALUMINA.—14/15% £7 15s. per ton; 17/18% iron free, £9 10s. per ton, c.i.f. U.K. prompt.

AMMONIA, ANHYDROUS.—No change in price, 1s. 6d. per lb., ex station.

AMMONIA CARBONATE.—Lump 4d. per lb.; ground 4½d. per lb., delivered.

AMMONIA MURIATE.—Grey galvanisers quality, £31 10s. per ton, f.o.r.

AMMONIA SULPHATE.—25¼%, £15 5s. per ton; 25¾% neutral, £16 8s. per ton, ex works. January/February.

ARSENIC, WHITE POWDERED.—Still higher quotations. Now £74 to £75 per ton, ex quay.

BARIUM CHLORIDE.—English material offered at £18 per ton, ex works; Continental, £16 5s. per ton, c.i.f. U.K.

BARYTES.—Finest English white, £5 5s. per ton, ex works.

BLEACHING POWDER.—Spot lots, £11 10s. per ton, ex station.

BORAX.—Crystal or granulated, £28 per ton; powdered, £29 per ton, carriage paid U.K. stations.

CALCIUM CHLORIDE.—English make, £5 15s. per ton, ex quay or station; Continental, about £4 10s. per ton, ex store.

COPPER SULPHATE.—Offered at £26 per ton, f.o.b. U.K.

COPPERAS, GREEN.—Price £3 15s. per ton, ex works.

FORMALDEHYDE, 40%.—Quoted £89 per ton, ex wharf, early delivery. Spot lots about £92.

GLAUBER SALTS.—Fine crystals £4 per ton, ex store.

LEAD.—English red advanced 10s. per ton; now £40 5s., carriage paid U.K. stations; Continental red lead, £36 per ton, ex store; white also advanced 10s.; now £52 per ton, carriage paid U.K. stations.

LEAD ACETATE.—White crystals, £37 per ton, ex wharf, early delivery.

MAGNESITE.—Finest Grecian about £9 per ton, ex station.

MAGNESIUM CHLORIDE.—Spot lots offered at £4 per ton, ex store.

POTASSIUM BICHROMATE.—English make, 6d. per lb., delivered.

POTASSIUM CARBONATE, 90/92%.—Quoted £27 per ton, ex store, spot delivery.

POTASSIUM CAUSTIC, 88/92%.—Inclined to be higher at £29 10s. to £30 per ton, ex store.

POTASSIUM CHLORATE, 98/100%.—Quoted 3½d. per lb., ex store.

POTASSIUM NITRATE (SALTPETRE).—Offered at £24 per ton, c.i.f. U.K.

POTASSIUM PERMANGANATE.—B.P. crystals, 8¼d. per lb., ex store.

POTASSIUM PRUSSIATE, YELLOW.—Unchanged 1s. 6d. per lb., ex station.

POTASSIUM SULPHATE.—Quoted £15 per ton, f.o.b. U.K., basis 90%.

SODIUM ACETATE.—About £24 per ton, ex store.

SODIUM BICARBONATE.—Refined quality, £10 10s. per ton, ex quay or station; mineral water quality, £1 10s. per ton less.

SODIUM BICHROMATE.—English make, 4½d. per lb., delivered U.K.

SODIUM CARBONATE (SODA CRYSTALS).—£5 5s. to £5 10s. per ton, ex quay or station.

SODIUM CARBONATE (ALKALI 58%).—£8 17s. 6d. per ton, ex quay or station.

SODIUM CAUSTIC.—76/77%, £21 10s. per ton; 70/72 %, £20 per ton; 60/62%, broken, £21 5s. per ton; 98/99%, powdered, £24 17s. 6d. per ton, ex station.

SODIUM CHLORATE.—Offered at 2¼d. per lb., c.i.f. U.K.

SODIUM HYPOSULPHITE.—Commercial quality, £10 10s. per ton, ex station; pea crystals, £16 per ton, ex station.

SODIUM NITRATE, 96/98%.—Quoted £13 per ton, f.o.r. or f.o.b. U.K.

SODIUM PRUSSIATE (YELLOW).—Quoted 10¾d. per lb., ex store.

SODIUM SULPHATE (SALTCAKE, 95%).—Price for home consumption, £4 per ton, on contract. Higher prices for export.

SODIUM SULPHIDE.—60/62% conc., £13 10s. per ton, c.i.f. U.K.; 30/32% crystals, £7 5s. per ton, c.i.f. U.K.

SULPHUR.—Government surplus stocks of Sicilian thirds still available at £3 10s. to £3 15s. per ton, ex depot. Flowers, £10 per ton; roll, £9 per ton; rock, £8 per ton; ground, £8 per ton. Prices nominal.

TIN CRYSTALS.—Unchanged at 1s. 2d. per lb.

ZINC CHLORIDE.—98/100% solid Continental material, £23 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ALPHA NAPHTHYLAMINE.—In good demand. Price 1s. 6½d. to 1s. 7½d. per lb.

BENZIDINE BASE.—Small inquiry. Price quoted, 6s. 6d. per lb., 100% basis.

BENZOL, 90's.—Supplies are offered at 1s. 8d. per gallon.

BETA NAPHTHYLAMINE.—Small home inquiry. Price quoted 4s. 3d. per lb., delivered.

BETA OXY NAPHTHOIC ACID.—Some good home inquiries. Price quoted 10s. per lb.

CARBON BISULPHIDE.—Small home inquiry. Price quoted £30 per ton, ex works.

NAPHTHIONIC ACID.—Good home inquiries. Price quoted, 2s. 6d. per lb. on 100% basis, carriage paid.

NAPHTHALENE (PURE POWDER).—Small home inquiry. Price quoted, £16 per ton, carriage paid, packed in free bags.

ORTHO DICHLORBENZOL.—Supplies are offered at £62 per ton, f.o.b. drums included.

PARA AMIDO PHENOL BASE.—Small inquiry. Price quoted, 7s. 6d. per lb. 100% basis, carriage paid.

PARA DICHLORBENZOL.—Good inquiries, both home and export. Price £50 per ton, carriage paid or f.o.b.

PARANITRANILINE SULPHONIC ACID.—Home inquiry. Price quoted, 5s. 3d. per lb. 100% basis, carriage paid.

PARANITRANILINE.—Prices lower, at 2s. 7d. per lb. for ton lots.

PARA TOLUIDINE.—Quiet; price, 5s. per lb.

PHTHALIC ANHYDRIDE.—Home inquiry. Price quoted, 2s. 5d. per lb, delivered.

Carriage of Sodium Sulphide

AT the Limerick Quarter Sessions last week before Judge Pigot, E. O'Callaghan and Son, Ltd., sued the Great Southern and Western Railway Co. to recover £11 5s. damages for the loss of a quantity of sodium sulphide in transit from London to Limerick in November last. For the defence it was stated that although the barrels in which the sulphide was packed were not in good repair they were accepted by the company, but they denied liability. The claim was dismissed.

Company News

CONSETT SPANISH ORE CO.—Announcement is made of the declaration of an interim dividend of 1s. per share.

JOHN KNIGHT, LTD.—The directors announce a dividend of 2s. 6d. per share on the preferred ordinary shares.

MOND NICKEL CO., LTD.—The interim dividend payable on March 3 will be paid to the transferor in respect of any transfers received for registration after January 29.

JURGENS, LTD.—A half-yearly dividend at the rate of 7 per cent. was payable on Thursday on the cumulative participating preference shares, subject to tax deduction at 5s. in the £.

KEELINGS OXIDES (1921), LTD.—After providing for all charges except taxation, the accounts to December 13 last show a loss of £1,306, increasing the debit balance brought down to £9,819.

LEVER BROTHERS, LTD.—At a meeting of shareholders on Tuesday a resolution was passed for converting the 5 per cent. cumulative preferred ordinary shares into 8 per cent. cumulative preferred ordinary shares.

BORAX CONSOLIDATED, LTD.—It has been decided to pay a final dividend of 1s. 6d. per share (7½ per cent.), less tax, at 5s. 6d. on the deferred ordinary shares, making 12½ per cent. for the year to September 30 last. A similar distribution was made in the preceding year.

BRITISH OIL AND CAKE MILLS, LTD.—A final dividend of 5 per cent., less tax, has been announced on the ordinary shares, making 10 per cent., less tax, for the year. The directors hope that the accounts will be in the hands of the shareholders by the end of April. A similar distribution was made in respect of the previous year.

HUELVA COPPER AND SULPHUR MINES, LTD.—A dividend of 8d. per share will be paid on February 13 to holders registered on January 31. Coupon No. 1 (share warrants to bearer) will be payable on and after February 13 on presentation at the London office of the company or at the Credit Lyonnais, Paris, and branches. Transfer books are closed until February 12.

BRITISH DYESTUFFS CORPORATION, LTD.—The directors announce that the trading results to October 31 last do not permit of the payment of a dividend on the preference shares for that period. The report and accounts will be issued to shareholders as soon as certain matters still outstanding with the Revenue authorities have been settled. The last dividend paid on the preference shares was 3½ per cent. actual for the half year ended October 31, 1920.

ENGLISH VELVET AND CORD DYERS.—Final dividends for the half-year to December 31 last, at the rate of 5 per cent. per annum on the cumulative preference shares and at the rate of 10 per cent. per annum on the ordinary shares (making 8 per cent. for the year) have been declared, both payments being subject to deduction for tax. After placing £10,000 to reserve and a similar sum to the employees' benefit fund there remain £36,034 to be carried forward. For 1921 the dividend was the same.

A Hydro-Extractor Fatality

AT Radcliffe, near Manchester, on January 26, an inquiry was held into the cause of the death of Thomas Pilkington, aged 60 years, who met with a fatal accident at the chemical works of Messrs. Walker Hardman, Dale Street, Radcliffe, on January 24. Pilkington was in charge of an electric hydro-extractor when something went wrong with the machine. It was stated that a heavy cast-iron guard flew off and struck the man, killing him instantly. The firm's manager, Mr. W. B. Nuttall, said that Pilkington had attended to the machine for about twelve years, and was a very competent man. Witness said the wrought-iron band round the extractor case had snapped, the guard plate being knocked off and falling in three parts. The machine was bought in 1911, but was not brand new. Four months ago some bumping was noticeable, and it was found that renewals were needed. The inner case was taken out and the band was right then. The witness did not think the mishap was due to high speed. A verdict of "Accidental death" was returned.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LOCALITY OF FIRM OR AGENT.	MATERIAL.	REF. No.
Spain and Portugal	Sulphate of copper.	113
India.....	Chemists' and druggists' sundries.	117
Latvia	Fats for soap-making.	131
Christiania	Vegetable oils and cattle cake.	141

"Chemical Age" Inquiry List

The following inquiries have been received from readers of "The Chemical Age." Replies addressed to the box number given below, c/o "The Chemical Age," 8, Bouverie Street, London, E.C.4, will be forwarded to the inquirers.

Manufacturers of ferrous sulphate.—No. H5.

Manufacturers of hydrogenated phenols.—No. H6.

Portuguese agency wanted for copper sulphate and fertilisers.—No. H7.

Manufacturers of or dealers in American (Petrol) lamp black.—No. H.8.

Contracts Open

Tenders are invited for the following articles. The latest dates for receiving tenders are, when available, given in parentheses:

BULGARIA (February 19).—Hydrochloric acid (100 litres), lead, glass containers for Meidinger Cells. Particulars from Department of Overseas Trade (Room 49), 35, Old Queen Street, London, S.W.1.

EGYPT (February 7).—Acids, greases, paints, oils. Particulars from Department of Overseas Trade (Room 84), 35, Old Queen Street, London, S.W.1. Reference No. 9,777/FE/G.P.

EGYPT (March 15).—Photographic chemicals. Particulars from Department of Overseas Trade (Room 84), 35, Old Queen Street, London. Reference No. 9726/F.E./G.C.(2).

LONDON (February 14).—Cement, lead, copper, zinc, glass, oils, greases, tallow, soap, tar, metal polish, paints, varnishes, linseed oil, turpentine, etc. Particulars from Chief Engineer (Room 155) Metropolitan Water Board, New River Head, 173, Rosebery Avenue, London, E.C.1.

Organised Application of Research in Industry

AT a meeting of the Midland Section of the Society of Dyers and Colourists held at University College, Nottingham, on January 25, a paper on "Science in Public Affairs," by Dr. H. H. Hodgson was read by Mr. R. W. Sutton, B.Sc., and was followed by a "Demonstration of the New Daylight Matching Lamp," by Mr. F. E. Lamplugh, M.A. Mr. Hodgson's paper called attention to the necessity of organising both research and its applications in order to maintain a level of civilised comfort in our population, and quoted the prophetic words spoken in this connection by Lord Haldane in 1906. The ethical ideals of industry must also be raised by closer association with the higher education. In school science the cultural, as well as the disciplinary value must be brought out. Reference was also made to the necessity of establishing a successful dye industry as a safeguard to trade and an aid in the development of other chemical industries.

The demonstration of the daylight saving lamp followed the lines of a paper read before the Bradford Section recently. Ordinary daylight showed a considerable variation, but by taking a cloudy day and north aspect as standard and as arbitrarily equal to 1 over the visible spectrum a graph could be constructed giving the comparative curve of a good artificial light, and the excess of red in this spectrum could then be cut off by suitable absorbing glasses, the manufacture of which was a very difficult art. The conditions of colour matching, which should avoid difficulties of a physiological nature, were also described.

THE BRITISH ALIZARINE COMPANY LTD.

Manchester **London** **Glasgow**

Manufacturers of Alizarine Dyestuffs

ALIZARINE RED (all shades)

ALIZARINE BLUES (soluble and insoluble)

ALIZARINE BORDEAUX

ALIZARINE CYANINE

ALIZARINE GREEN (soluble and insoluble)

ALIZARINE ORANGE

ALIZARINE RED S. POWDER

ALIZARINE BLUE BLACK

ALIZARINE (MADDER) LAKES (of all qualities)

ALIZARINE MAROON

ALIZUROL GREEN (Viridine)

ANTHRACENE BROWN

ALIZANTHRENE BLUE

ALIZANTHRENE BROWN

ALIZANTHRENE YELLOW

Other fast colours of this series in course of preparation

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CHROME TANNING and other Chrome Compounds

TELEPHONES
663 Trafford Park, MANCHESTER
560 EAST LONDON
2007 DOUGLAS, GLASGOW

TELEGRAMS:
BRITALIZ MANCHESTER
BRITALIZ LONDON
BRITALIZ GLASGOW

All communications should be addressed to

The British Alizarine Co., Ltd.
Trafford Park, Manchester

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

BEVAN, M. L., Woodfield Street, Morriston, druggist. (C.C., 3/2/23). £13 1s. 4d. December 8.

GALT, T. J., 25, Railway Street, King's Lynn, chemist and optician. (C.C., 3/2/23.) £29 2s. 11d. December 11.

JAMIESON, George, W. A., 95, Wesley Street, Newcastle-on-Tyne, chemist. (C.C., 3/2/23.) £37 1s. 11d. December 6.

LLEWELLYN, W., 135, Dunraven Street, Tonypandy, chemist. (C.C., 3/2/23.) £11 10s. 1d. December 18.

LOW, Kenneth S., 10, Claro Terrace, Earl's Court, chemical maker. (C.C., 3/2/23.) £11 5s. 10d. December 14.

POWELL, Hindley, 65, Stoneleigh Road, Perry Barr, Birmingham. (C.C., 3/2/23.) £11 14s. 4d. December 13.

Receivership

WOODCROFT MANUFACTURING CO., LTD., manufacturing chemists, etc., Liverpool. (R., 3/2/23.) J. C. Oldfield, of 61, Lord Street, Liverpool, was appointed receiver and manager on January 24, 1923, under powers contained in debenture dated August 17, 1922.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

HEATHS (LIVERPOOL), LTD., chemists. (M., 3/2/23.) Registered January 16, £600 (not exceeding) equitable mortgage, to Bank; charged on 188, Windsor Street, Liverpool. *£400. November 22, 1922.

STRANGE AND GRAHAM, LTD., London, E.C., chemists. (M., 3/2/23.) Registered January 16, £6,450 debentures; general charge. *Nil. December 31, 1921.

London Gazette

Companies Winding Up Voluntarily

DUROLINE MANUFACTURING CO., LTD. (C.W.U.V., 3/2/23.) F. S. Salaman (of Elles, Salaman, Coates and Co.), Chartered Accountant, 1 and 2, Bucklersbury, London, appointed liquidator. Meeting of creditors at the liquidator's office on Thursday, February 8, at 12 noon.

RHUAKA REMEDIES, LTD. (C.W.U.V., 3/2/23.) Alfred Fielding, Chartered Accountant, 5, Somerset House, George Street, Halifax, appointed liquidator. Meeting of creditors at the liquidator's office on Tuesday, February 6, at 3 p.m.

Notice of Dividend

JOHNSON, Joseph Melbourne, High Street, Upton-on-Severn, in the county of Worcester, chemist. Amount per £, 1s. 6½d. Supplemental. Payable, February 9, Official Receiver's Office, Ruskin Chambers, 191, Corporation Street, Birmingham.

Partnership Dissolved

JOHN FRASER AND CO. (Harold Edwin SABEY and Alfred LOVEGROVE), paint and varnish manufacturers and merchants, 136, Southwark Street, S.E.1, and 317, High Holborn, W.C., by mutual consent as from December 31, 1922. Debts received and paid by H. E. Sabey.

New Companies Registered

COAL GAS AND ELECTRICAL INVESTMENT, LTD., 14 and 16, Cockspur Street, London, S.W. Manufacturers of chemicals and manures; distillers, dye makers and metallurgists, etc. Nominal capital, £1,000 in 950 preference shares of £1 each and 1,000 ordinary shares of 1s. each.

FUEL TREATMENT AND RESEARCH CO., LTD., 17B and 17C, Aylesbury Street, Clerkenwell Green, London, E.C. Chemical manufacturers, chemists, druggists, drysalters and oil and colourmen, etc. Nominal capital, £1,000 in 5s. shares.

ARTHUR IRWIN, LTD., 12, Talbot Square, Blackpool. Chemical manufacturers, oil and colourmen, etc. Nominal capital, £5,000 in £1 shares.

ARTHUR LUMB AND CO., LTD., Atlas Oil and Engineering Works, North Bridge, Halifax. Metal polish and chemical manufacturers, etc. Nominal capital, £2,000 in £1 shares.

McLAREN, BROWN AND CO., LTD., 347, Leadenhall House, Leadenhall Street, London, E.C.3. Manufacturers of chemicals and manures, distillers, dye-makers, etc. Nominal capital, £1,000 in £1 shares.

PETRI BROTHERS, LTD., 24, Minories, London, E.C. Chemists, druggists, drysalters, oil and colourmen, etc. Nominal capital, £5,000 in £1 shares.

JOHN R. SCHOLES, LTD., 14, Argyle Chambers, 67, Hanging Ditch, Manchester. Importers and exporters of and dealers in chemicals, colours, oils, paints, drugs, etc. Nominal capital, £5,000 in 1 shares.

VEETA CHEMICAL CO., LTD., 17, Piccadilly, Bradford. Chemical manufacturers, soap makers, oil merchants, etc. Nominal capital, £1,500 in £1 shares (250 7 per cent. preference).

British Dye Industry and War

SPEAKING at a dinner of the Huddersfield Chamber of Commerce on January 25, Sir W. Joynson-Hicks said the Government were quite determined that for the future we could not be left to the mercy of any foreign country in the event of war in regard to dyestuffs, and, what was more important, in regard to the products of the chemical factories. It would be futile on the part of any Government to rest its policy on the certainty that there would be no such thing as war in the future. We were developing our dyes. A large number of dyes were now being produced in this country as good as the German dyes. They would not rest until we were able to compete on level terms in the dye markets of the world.

Control Formulæ in Connection with Leaching

A PAPER on "Some Control Formulæ in connection with Leaching and Evaporating" will be read by Professor F. G. Donnan, of the University College, Gower Street, London, at the Chemical Industry Club, 2, Whitehall Court, London, on Friday, February 9, at 8 p.m., under the auspices of the Chemical Engineering Group, when Mr. J. Arthur Reavell, M.I.M.E., chairman of the Group, will preside. All interested in this subject, whether members of the Group or of the Club, are cordially invited to attend.

Acid Phosphate as a Fertiliser

IN scientific farming circles in Germany, states the *Fruit Grower*, there is a difference of opinion as to the use of acid phosphate as a fertiliser. It is stated that 650,000 tons annually were used in Germany before the war, while the present domestic supply is 175,000 tons, mostly Thomas slag. It has been ascertained from experiments made during the past ten years that the soil in various parts of Germany is such as to call for the use of little or no acid phosphate for years at a time.

Recent Wills

Mr. Robert Kenworthy, of Leeds, oil extractor and manure manufacturer..... £9,229

Mr. Robert Williams, of St. John's, Isle of Man, and of Everton, Liverpool, oil and paint merchant £5,071